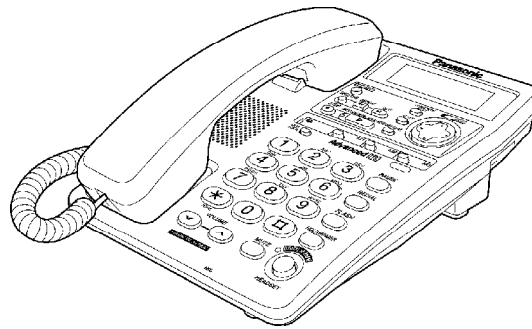# Service Manual

Telephone Equipment

Caller ID Compatible

KX-TMC40JX-W
Telephone Answering System
White Version
(for Asia, Middle Near East and other areas)

SPECIFICATIONS

■ SPECIFICATIONS

Power Supply:	AC adaptor (PQLV1BXZ, AC 220V~240V AC, 50/60 Hz)
Power Consumption:	Standby: Approx. 2.4W
	Maximum : Approx. 3.0W
Memory Capacity:	50 Caller ID memory, 50 Directory memory
Dialing Mode:	Tone(DTMF)/Pulse(10pps)
Redial:	The unit redials the last 20 dialed numbers
Speaker Unit:	Unit: 5.7cm (2.5") PM magnetic type 8Ω
	Handset; 3 cm (1^{13}/$_{16}$) PM dynamic type, 150Ω
Microphone:	Electret condenser microphone
Input Jack:	Telephone Line, Data port
Operating Environment:	5°C - 40 °C (41 °F - 104 °F)
Dimension (H x W x D):	6^9/$_{16}$" × 8^{13}/$_{16}$" × 3^3/$_4$" (167 × 224 × 95 mm)
Weight:	1.50 lbs. (680g)

Design and specifications are subject to change without notice.

⚠ **WARNING**

This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service
or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

Panasonic

When you mention the serial number, write down all 11 digits. The serial number may be found on the label affixed to the
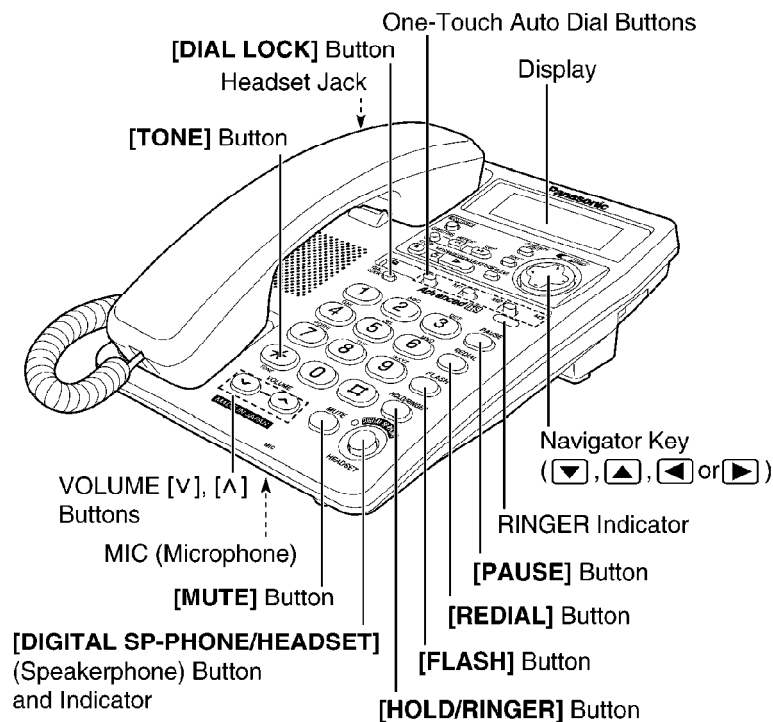bottom of the unit.

FOR SERVICE TECHNICIANS

ICs and LSIs are vulnerable to static electricity.
When replacing, the following precautions will help prevent recurring malfunctions.
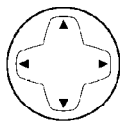1. Cover the plastic parts boxes with aluminum foil.
2. Ground the soldering irons.
3. Use a conductive mat on the work table.
4. Do not grasp IC or LSI pins with bare fingers.
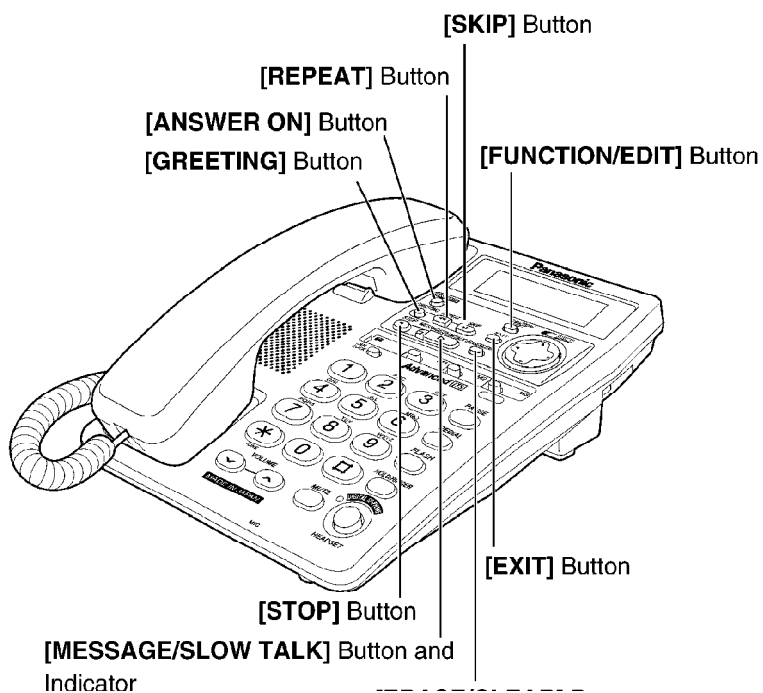
1. LOCATION OF CONTROLS

One-Touch Auto Dial Buttons

[DIAL LOCK] Button

Headset Jack

Display

[TONE] Button

Navigator Key
([▼],[▲],[◄] or[►])

VOLUME [∨], [∧]
Buttons

RINGER Indicator

MIC (Microphone)

[PAUSE] Button

[MUTE] Button

[REDIAL] Button

[DIGITAL SP-PHONE/HEADSET]
(Speakerphone) Button
and Indicator

[FLASH] Button

[HOLD/RINGER] Button

How to use the Navigator key

This key has four active areas that are indicated by arrows.

* Pressing the up and down arrows allows you to enter the Caller List and scroll through the function menu, the Caller List and the Directory list.
* Pressing the right and left arrows allows you to enter the Directory list and move the cursor when entering items.
* The right arrow is used to select or confirm your menu choices.

Throughout this Operating Instructions, the navigator key is indicated by the arrows [▲], [▼], [◄] or [►].

[SKIP] Button

[REPEAT] Button

[ANSWER ON] Button

[GREETING] Button

[FUNCTION/EDIT] Button

[EXIT] Button

[STOP] Button

[MESSAGE/SLOW TALK] Button and
Indicator

2. DISPLAYS

Both the handset and the base unit show you instructions and information on the displays. These display prompts are shown below.

```
1234567890123456
ABCDEFGHIJKLMNOP
abcdefghijklmnop
```
(This display shows all of the possible configurations.)

```
12:34AM 21.5
  10 new calls
   5 messages
```
When the handset on the cradle, the AC adaptor is connected and the DIGITAL SP-PHONE/HEADSET indicator light is off, the display shows the current time and date, the number of new calls, and the number of recorded messages while Answering System is on.

```
12:00AM 1.1
  0 message
```
If "⊕" flashes on the display, the clock needs adjusting.

```
12:34AM 21.5
01-06-35
```
During a conversation, the display shows the length of the call (Ex, 1 hour, 6 minutes and 35 seconds).

```
111444777
11:50AM 24.11 x3
```
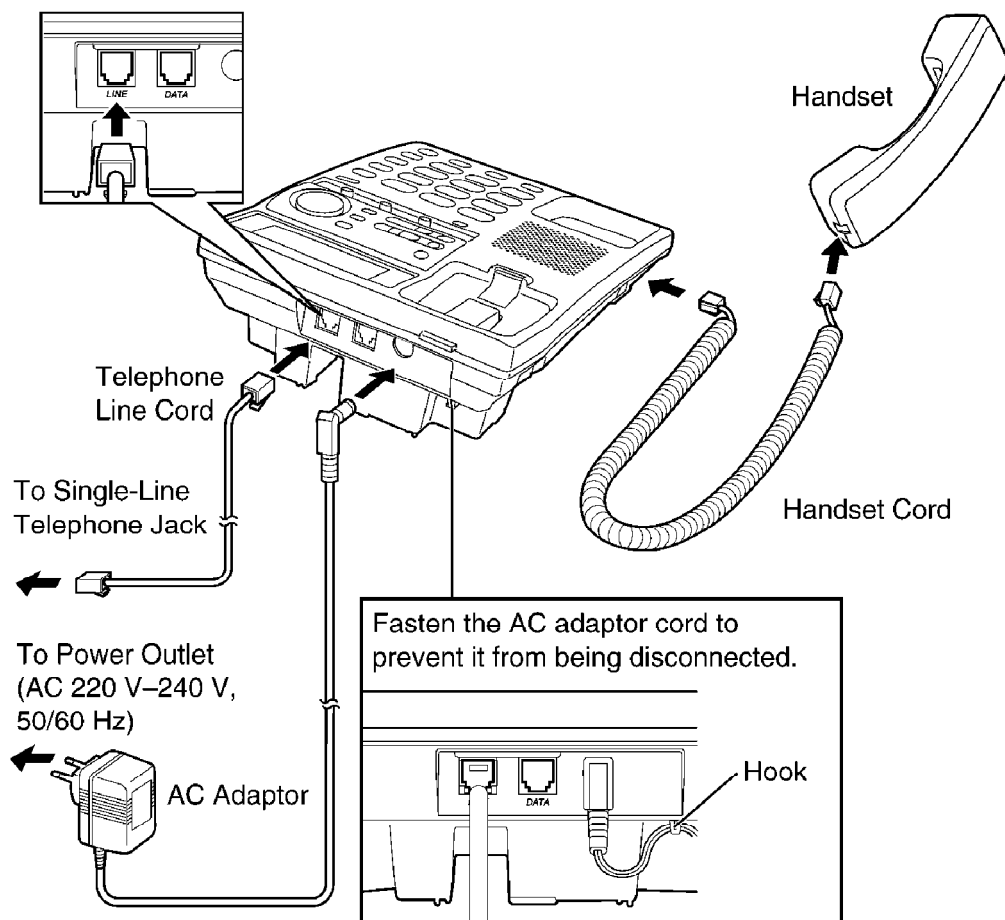This is a display from the Caller List. The display shows:
— the caller's number,
— the time and date of the last call (Ex. Nov. 24, 11:50 AM), and
    the number of times called (Ex. 3 times).

- ⟲ : The dial lock mode is set. To cancel the mode.
- ✉ : [MUTE] was pressed during a conversation.
- ✕ : The ringer is set to off.
- ♫ : The unit plays music during the hold for a caller.
- ✎ : The unit enters in the directory.
- ☎ : [REDIAL] was pressed while the handset is on the cradle and DIGITAL SP-PHONE/HEADSET indicator is off.
- P : [PAUSE] was pressed while dialing or storing phone numbers.
- F : [FLASH] was pressed while storing phone numbers.

3. CONNECTION

3.1. Connecting the Handset/AC Adaptor/Telephone Line Cord

Handset

Telephone
Line Cord

To Single-Line
Telephone Jack

To Power Outlet
(AC 220 V–240 V,
50/60 Hz)

AC Adaptor

Handset Cord

Fasten the AC adaptor cord to
prevent it from being disconnected.

DATA

Hook

- **USE ONLY WITH Panasonic AC ADAPTOR PQLV1BXZ.**
- **Use only a Panasonic Handset for the KX-TMC40BXW.**
- **The AC adaptor must remain connected at all times. (It is normal for the adaptor to feel warm during use.)**
- **If your unit is connected to a PBX which does not support Caller ID services, you cannot access those services.**

3.2. Connecting a Communication Device

If you connect a communication device (computer, modem, fax, etc.) to the telephone line, you can connect it through this unit using the DATA jack.

After connecting the handset AC adaptor and telephone line cord, connect the communication device telephone line cord to the DATA jack.

³Computer
³Modem
³Fax
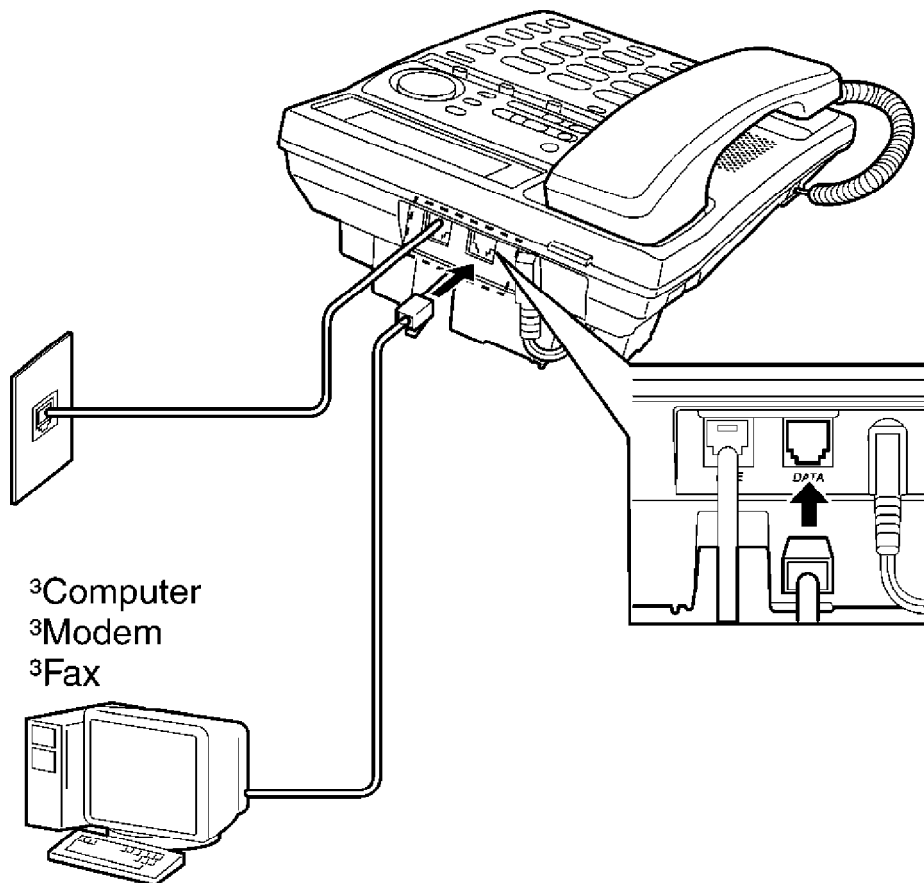
- Make sure the communication device is not in use before using this unit (making calls, storing phone numbers in memory etc.) or the communication device may not operate properly.

4. SETTINGS

∗ To Set the Each Settings (4.1. ∼ 4.12.) Back to the Factory Default < for Service>

You can set the each settings (4.1. ∼ 4.12.) back to the factory default by taking off the battery and leave the unit for a while (about 3 minutes).

If the batteries installed in the unit expire, programmed information may be erased. After the batteries are replaced, reprogram if necessary.

4.1. Dialing Mode

If you have touch tone service, set to Tone. If rotary or pulse service is used, set to Pulse. Your phone comes from the factory set to Tone.
Make sure that the handset is on the cradle, the AC adaptor is connected and the DIGITAL SP-PHONE/HEADSET indicator light is off.

1 Press [FUNCTION/EDIT].

```
_____
►Save directory
 Save M1,M2,M3
```

2 Scroll to "program" by pressing [▼] or [▲].

```
 Save M1,M2,M3
►Program
 TAD program
```

3 Press [►].

```
_____
►LCD contrast
 Set clock
```

4 Scroll to "Set dial mode" by pressing [▼] or [▲].

```
 Set flash time
►Set dial mode
 Set hold music
```

5 Press [►].

```
Dial mode
:Tone
▼▲          ►=Save
```

6 Select "Pulse" or "Tone" or pressing [▼] or [▲].

7 press [►] (Save **key**).

• A long beep sounds.
• The display will return to step 4. To exit the programming mode, press [EXIT] or wait for 60 seconds.

•You can exit the programming mode any time by pressing [EXIT].

4.2. Time and Date

You can select AM/PM or 24-hour clock by programming.

> **Voice Time/Day Stamp:** During playback a synthesized voice will announce the time and day that each message was recorded.

Make sure that the handset is on the cradle, the AC adaptor is connected and the DIGITAL SP-PHONE/HEADSET indicator light is off.

1 Press [FUNCTION/EDIT].

2 Scroll to "Program" by Pressing ▼ or ▲ and press ►.

3 Scroll to "Set Clock" by pressing ▼ or ▲.

```
LCD contrast
►Set clock
 Change password
```

4 Press ►.

```
12:00AM  01.01
2002
        ►=Set clock
```

5 Press ► (Set Clock key).

```
Enter year
2002
        ▼=Next
```

6 Enter the current year.
(Ex. To set 2002, enter "2002".)
•You can set the year 2000 to 2099.

```
Enter year
2002
        ▼=Next
```

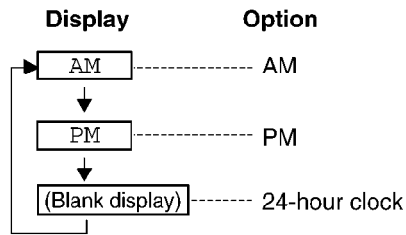**7** Press ▼ (Next key).

```
Enter time
12:00
        ▼=Next
```

8 Enter the current time (hour and minute) using a 4-digit number.
(Ex. To set 9:30, enter "0930")
•For AM/PM setting: Enter numbers between 0100 and 1259.
•For 24-hour clck: Enter numbers between 0000 and 2359.

```
Enter time
09:30
        ▼=Next
```

9 Press ▼ (Next key).
•If numbers between 0000 and 0059, or 1300 and 2359 are entered, the time will automatically be set using the 24-hour clock. Skip the steps 10 and 11, and go to the step 12.

```
*=AM/PM
AM
        ▼=Next
```

10 Press ✱ to select "AM", "PM" or 24-hour clock.
(Ex. You select "PM".)

```
✱=AM/PM
PM
            ▼=Next
```

Display   **Option**

AM ------------ AM

↓

PM ------------ PM

↓

(Blank display) ------- 24-hour clock

•Each time you press ✱ , the selection will change on the display.

11 Press ▼ (Next key).

```
Enter  day.month
01.01
            ▶=Save
```

12 Enter the current day and month using a 4-digit number.
(Ex. To set Dec. 27, enter "2712".)

```
Enter  day.month
27.12
            ▶=Save
```

13 Press ▶ (Save key).

•A long beep sounds.
•The clock starts working.
•The display will return to set 3. To exit the programming mode, press EXIT or wait for 60 seconds.

•You can go back to the previous screen by pressing ▲ , when setting the time and date (steps 5 through 12).
•If 3 beeps sound when entering the time and date, the time and date entered are not correct. Enter the correct time and date.

> If a power failure occurs, " 🕐 " will flash. Readjust the time/date.

For Caller ID service users
If a time display service is available with the Caller ID service:
•The Caller ID information will re-set the clock after the ring if the adjusted time and/or date is incorrect. However, if the time/date has not previously been set, the Caller ID information will not adjust the clock.

4.3. LCD Contrast

You can select the LCD contrast level from 1 to 4 by programming. To make the display clearer, set to high level. Your phone comes from the factory set to 3. **Make sure that the handset is on the cradle, the AC adaptor is connected and the DIGITAL SP-PHONE/HEADSET indicator light is off.**

1 Press [FUNCTION/EDIT].

2 Scroll to "Program" by pressing [▼] or [▲] and press [▶].

```
  _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
▶LCD contrast
 Set clock
```

3 Press [▶] at "LCD contrast".
 • The current setting is displayed.

```
LCD contrast
 Low ▮▮▮    High
▼▲         ▶ =Save
```

4 Select the desired contrast be pressing [▼] or [▲].

5 Press [▶] (Save key).
 • A long beep sounds.
 • The display will return to step 2. To exit the programming mode, press [EXIT] or wait for 60 seconds.

 • You can exit the programming mode any time be pressing [EXIT].

Ringer Volume

Make sure that the AC adaptor is connected and the unit is not being used.

To select HIGH (preset) or LOW, press **[HOLD/RINGER].**
 • Each time you press the button, the ringer volume will change and the selected volume will ring.

To turn the ringer OFF, press and hold **[HOLD/RINGER]** until 2 beeps sound.
 • " ✗ " is displayed.

To turn the ringer ON, press **[HOLD/RINGER].**
 • The ringer will sound at the HIGH level.

4.4. Making Calls

You can make a call by simply lifting the handset. To hang up, place the handset on the cradle.

Using the speakerphone

1 Press (**DIGITAL SP-PHONE/HEADSET**).
The indicator lights.

```
12:34PM 24.11
```

2 Dial a phone number.
• The dialed number is displayed.
• After a few seconds, the display will show the length of the call.
• If you misdial, hang up and start again from step 1.

```
12:34PM 24.11
1234567890
```

```
12:34PM 24.11
00-00-00
```

3 When the other party answers, talk into the **MIC** (microphone).

4 To hang up, press (**DIGITAL SP-PHONE/HEADSET**).
• The indicator light goes out.

```
12:34PM 24.11
0 message
```

During speakerphone operation
For best performance, please note the following:
• Talk alternately with the other party in a quiet room.
• If the other party has difficulty hearing you, press **VOLUME** ⊡ to decrease the speaker volume.
• You can switch to the handset by lifting it up. To switch back to the speakerphone, press (**DIGITAL SP-PHONE/HEADSET**).

To redial the last number dialed

Using the handset: Lift the handset ➡ press (REDIAL).

Using the speakerphone: Press (**DIGITAL SP-PHONE/HEADSET**) ➡ Press (REDIAL).

Automatic Redial:
When using the speakerphone, the unit redials the last dialed number up to 15 times within a 10-minute period if the line is busy. During redial, "Waiting redial" will be displayed and the DIGITAL SP-PHONE/HEADSET indicator light flashes.

To redial using the redial list (Memory Redial)

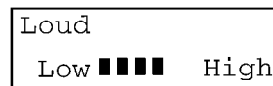The last 20 phone numbers dialed are stored in the redial list.
1. Press [REDIAL].
   * The last dialed number and " ◖● " are displayed.
   * When the number dialed has been stored in the directory or One-Touch Dialer, the name is
     also displayed.

2. Scroll to the desired number by pressing [▼] or [▲].
   * You can also scroll through the list by pressing [REDIAL].
   * When you scroll to the most recent item, two beeps sound.
   * To exit the list, press [EXIT].
3. Lift the handset or press [DIGITAL SP-PHONE/HEADSET].
   • To erase an item, repeat steps 1 and 2, and press [ERASE/CLEAR].
   • If "No items stored" is displayed, the list is empty.

To adjust the handset volume (4 levels) or the speaker volume (8 levels) while talking

To increase, press **VOLUME** [∧].   To decrease, press **VOLUME** [∨].

Ex. Handset volume level: 2   Ex. Speaker volume level: 3

```
Loud
  Low ▮▮▮▮   High
```

```
Loud
  Low ▮▮▮      High
```

"▮▮" shows one level.   "▮" shows one level.

•The display shows the volume level for a few seconds.

To put a call on hold

Press [HOLD/RINGER] during a conversation.

•The SP-PHONE/HEADSET indicator flashes.
•If using the handset, you can place it on the cradle.
•During the hold, the caller will hear music.

To release the hold

If the handset is on the cradle, lift the handset.
If the handset is off the cradle, press [HOLD/RINGER].
If using the speakerphone, press [DIGITAL SP-PHONE/HEADSET].

•If another phone is connected on the same line, you can also release the hold by
 lifting its handset.

4.5. Answering Calls

When a call is received, the unit rings, the RINGER indicator flashes quickly and "Incoming Call" is displayed. You can answer a call by simply lifting the handset.
If you subscribe to a Caller ID service, the calling party's information will be displayed when the unit is ringing.

Using the speakerphone

1 Press [DIGITAL SP-PHONE/HEADSET].
  • The indicator lights.

2 Talk into the **MIC** (microphone).

3 To hang up, press [DIGITAL SP-PHONE/HEADSET].
  • The indicator light goes out.

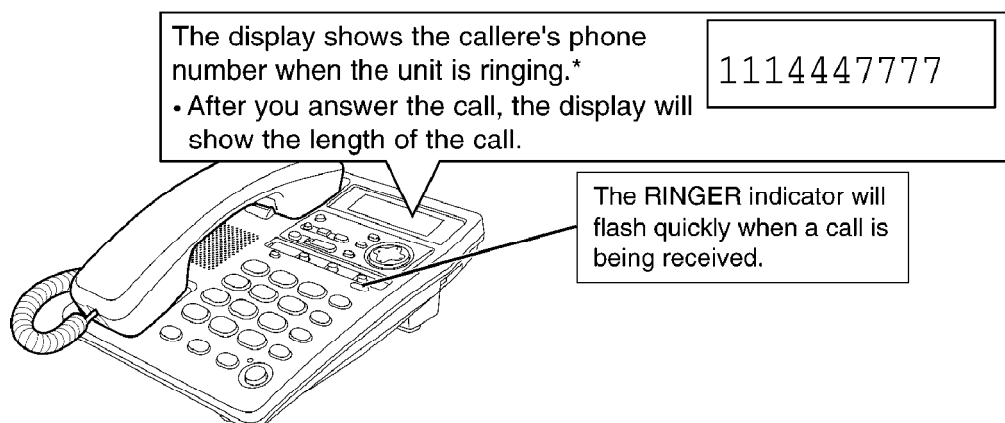 • When the ringer volume is set to OFF, the unit will not ring.

4.6. Caller ID Service

This unit is compatible with a Caller ID service offered by your telephone company. If you subscribe to a Caller ID service, the calling party's information will be displayed when the unit is ringing.

The unit can record information of up to 50 different callers, including the time and date received and the number of times called, in the Caller List. The Caller List information is sorted from the most recent to the oldest call. When the 51st call is received, the oldest call is deleted.

Using the list, you can automatically call back a caller. You can store the callers' numbers from the Caller List into the directory or the one-touch dialer memory.

How caller information is displayed when a call is received

The display shows the callere's phone number when the unit is ringing.*
• After you answer the call, the display will show the length of the call.

```
1114447777
```

The RINGER indicator will flash quickly when a call is being received.

*Private name display

If you receive a call from one of the same phone numbers stored in the directory or One-Touch Dialer the caller's name will be displayed.

```
TINA ROBINSON
1114447777
```

• To use this function, names and phone numbers must be stored in the directory or One-Touch Dialer.

• Caller information will not be displayed in the following cases:
— If the caller dialed from an area which does not provide a Caller ID service, the display will show "Out of area".
— If the caller has requested not to display his/her information, the display will show "Private Caller".
— If a long distance call is identified and the caller's name and/or number cannot be received, the display will show "Long distance".

• If your unit is connected to a PBX which does not support Caller ID services, you cannot access those services.

• If you receive a call with the Caller ID information while viewing the Caller List, the redial list, the directory list or the One-Touch Dialer, while programming or while playing back the message, the caller's information may not be displayed.

• If the name and the time/date display service is available in your area, the display will show caller's names and the time/date the calls were received. For further information, please contact your telephone company.

4.7. Usin the Caller List

If you have received 10 new calls, the number of new calls will be displayed as shown, while the unit is not in use.

```
12:34AM 21.5
  10 new calls
   0 message
```

4.8. Viewing the Caller List

To check who has called, follow the steps below.

1 Press ▼ or ▲ to enter the Caller List.
- For example, the display on the right will show.
- You can go to the directory list by pressing ▶.

```
Caller's list
   10 new calls
▼▲    ▶=Directory
```

2 To search from the most recent call,
press ▼.
- To search from the oldest call, press ▲.
- To scroll between callers, press ▼ or ▲.

3 To exit the Caller List, press EXIT.

- If "No items stored" is displayed in step 1, the Caller List is empty.
- If more than one call is received from the same caller, the date and time of the most recent call will be recorded.

Ex. When you search from the most recent call:

```
Press ▼ or ▲ to enter the list.
```
↓
```
Caller's list
   2 new calls
▼▲    ▶=Directory
```
Press ▼.
↓
```
1114447777
11:50AM 24.11
```
Press ▼.
↓
*
```
JACK SMITH
1234567890
10:50AM 23.11 x4
```
Press ▼.
↓
**
```
456789012345678→
10:00AM 22.11 √
```
Press ◀ or ▶. →
```
4567890123456789
0123
```
←
Press ▼.
↓
```
Caller's list
   0 new call
▼▲    ▶=Directory
```
Press ▼.

To return to the previous caller,
press ▲.

To exit the Caller List, press EXIT.

Display meaning:

X2–X9: The number of times the same
√: caller called (up to 9).
You have checked this caller information, answered the call or called back the caller.

* If you receive a call from one of the same phone numbers stored in the Speed Dial List, the caller's name will be displayed **(Private name display)**.

** If an arrow (→) is displayed after the number, the whole phone number has not been shown, Press ◀ or ▶ to see the remaining numbers or to return to the previous display. Each time you press ◀ or ▶, the display will change alternately.

4.9. Calling Back from the Caller List

1 Press ▼ or ▲ to enter the Caller List.

2 Scroll to the desired caller by pressing ▼ or ▲ .
- To exit the Caller List, press EXIT or wait for 60 seconds.

```
1234567890
10:50AM 23.11 x4
```

3 Lift the handset or press DIGITAL SP-PHONE/HEADSET .
- The displayed phone number is dialed automatically.
- After a few seconds, the display will show the length of the call.

```
12:34PM 25.11
1234567890
```

```
12:34PM 25.11
00-00-00
```

- In some cases, you may have to edit the number before dialing.
- If a phone number is not displayed in the caller information, you cannot call back that caller.

4.10. Dial Lock

You can prevent others from making a call to any number except dialing by one-touch auto dial buttons. Only incoming calls are accepted unit the dial lock is canceled.

> Before using this feature, we recommend storing emergency numners in the memory of one-touch auto dial buttons. Even if the dialing buttons are locked, the numbers stored in these buttons can be dialed.

To set the dial lock

1 Press DIAL LOCK .
- " ⌐O " flashes on the display.

```
Enter password
:----
⌐O            ▶=Save
```

2 Enter the password.

```
Enter password
:0000
⌐O            ▶=Save
```

3 Press ▶ (Save key).
- A long beep sounds, and " ⌐O " displays.
- If the wrong password is entered, 3 beeps will sound. Enter the correct password.

> If the dial buttons are pressed after litting the handset or pressing DIGITAL SP-PHONE/HEADSET , "Dial locked" will be displayed.

4.10.1. To cancel the dial lock

Follow above steps 1 through 3. In step 3, " ⌐O " will go out.

4.11. How to Release the Establishment of Dial Lock

1 Press [FUNCTION/EDIT].

```
----------------
►Save speed dial
 Program
```

2 Press [▼].

```
 Save speed dial
►Program
 ----------------
```

3 Press [▶].

```
----------------
►LCD contrast
 Set clock
```

4 Press [▼].

```
 LCD contrast
►Set clock
 Change password
```

5 Press [▼].

```
 Set clock
►Change password
 Call restrict
```

6 Press [▶].

```
Current password
:----
          ▼=Next
```

7 Enter "726276642" (Panasonic) for initialzing of password.

```
Current password
:OOOO
          ▼=Next
```

8 Press [▼].

```
New password
:----
          ►=Save
```

9 Enter a new password 4 digits code by dial key pad (Ex."1234"). If you want to set the password for "DIAL LOCK" to "1111" (factory set), you should enter "1111".

```
New password
:1234
          ►=Save
```

10 Press [▶].

After this procedure, the password for "DIAL LOCK" will be returned to "1234".

```
New password
:1234
```

11 Press [EXIT].

12 To cancel the Dial Lock, follow "5.11.1. To Cancel the Dial Lock".

4.12. FLASH Button

Pressing ⎡FLASH⎤ allows you to use special features of your host PBX such as transferring an extension call or accessing special telephone services (optional) such as call waiting.

Selectin the flash time

The flash time depends on your telephone exchange or host PBX. You can select the following flash times: "90, 100, 110, 250, 300, 400, 600, 700 ms (milliseconds)" . Your phone comes from the factory set to "600 ms".
Make sure that the handset is on the cradle, the AC adaptor is connected and the DIGITAL SP-PHONE/HEADSET indicator light is off.

1 Press ⎡FUNCTION/EDIT⎤.

2 Scroll to "Program" by pressing ⎡▼⎤ or ⎡▲⎤, and press ⎡▶⎤.

3 Scroll to "Set flash time" by pressing ⎡▼⎤ or ⎡▲⎤.

```
 Call restrict
▶Set flash time
 Set dial mode
```

4 Press ⎡▶⎤.

```
Flash time
:600ms
▼▲          ▶=Save
```

5 Select the desired time by pressing ⎡▼⎤ or ⎡▲⎤.

6 Press ⎡▶⎤ (Save key).
• A long beep sounds.
  • The display will return to step 3. To exit the programming mode, press ⎡EXIT⎤ or wait for 60 seconds.

• You can exit the programming mode any time by pressing ⎡EXIT⎤.
• If the unit is connected via a PBX, PBX functions (transferring a call, etc.) might not work correctly. Consult your PBX supplier for the correct setting.

Note: for Service ; When there is no battery, a Flash function may not operate appropriately.

5. DISASSEMBLY INSTRUCTIONS

(A)

Fig. 1

Remove the
Main P.C. Board

Fig. 2

(B)
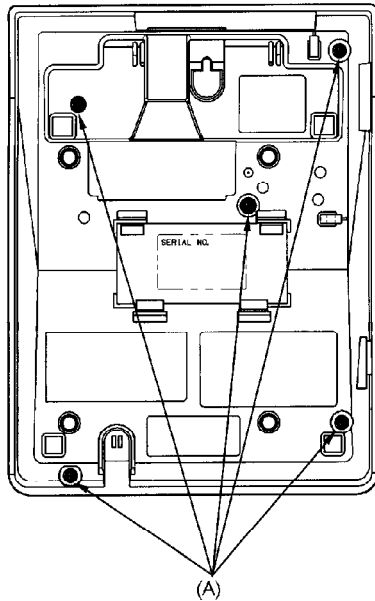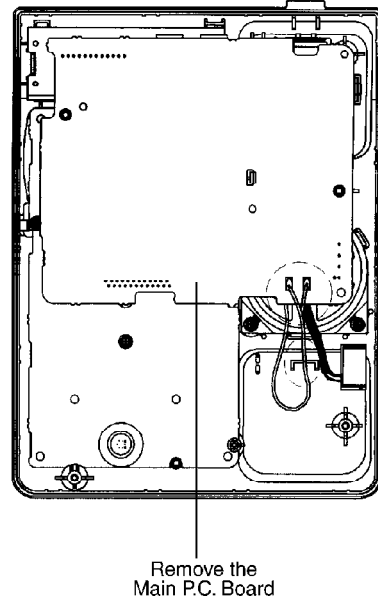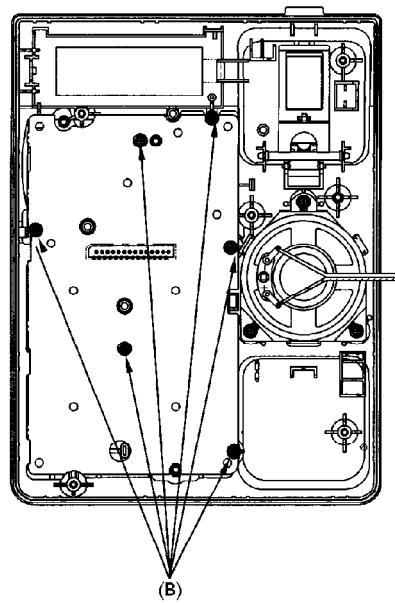
Fig. 3

Shown in Fig.-	To Remove	Remove
1	Lower Cabinet	Screws (2.6 X 12).....(A) X 5
2	Main P.C. Board	The Main P.C. Board
3	Operational P.C. Board	Screws (2.6 X 8).....(B) X 6

6. TROUBLESHOOTING GUIDE

MAIN

Power On Base UNIT	Not Display	Check Power
OK ↓		
Display on LCD	Display System Error	Error Message Table
OK ↓		
Playback Pre-Message	Not Playback	Check Playback
OK ↓		
Record	Not Record	Check Record
OK ↓		
Sp-phone Voice Transmission	No Voice	Check Sp-phone voice Transmission
OK ↓		
Sp-phone Voice Reception	No Voice	Check Sp-phone voice Reception
OK ↓		
Handset Voice Transmission	No Voice	Check Handset voice Transmission
OK ↓		
Handset Voice Reception	No Voice	Check Handset voice Reception
OK ↓		
Call ID function	Not Call ID	Check Call ID

Cross Reference:
Check Power ()
Error Message Table ()
Check Playback ()
Check Record ()
Check Sp-phone Voice Transmission ()
Check Sp-phone Voice Reception ()
Check Handset Voice Transmission ()
Check Handset Voice Reception ()
Check Call ID ()

6.1. Check Power

Is the AC Adaptor inserted into 230V outlet?

(AC Adaptor PQLV14BXZ)

Is correct of Q301 voltage 12 V more?	NO →	Check AC Adaptor.
YES ↓		
Is Pin 73, 97, 14 of IC201 voltage 3.3 V more?	NO →	Check Q301, D301, C301, R301, D302, C302, C303, IC303, C304, C305, D303, C306, L301. **Power Supply Circuit**
OK ↓		
Is a power-down signal High at pin 55 of IC201?	NO →	Check R302, R303, IC301, R231, C326. **Initializing Circuit.**
YES ↓		
Is a reset signal high at pin 54 of IC201?	NO →	Check R230, IC302, C325. **Initializing Circuit.**
YES ↓		
Does pin 51 of IC201 oscillate at 4.096MHz?	NO →	Check X200, C320, C321.
YES ↓		
Check LCD connect.		
YES ↓		
Check IC201.		

Cross Reference:
Power Supply Circuit ()
Initializing Circuit ()

NOTE:
Flash Memory are IC300 and IC306.
DSP is IC201.

6.2. Error Message Table

Display	Symptom	Remedy
E 1	The initialization was tried, but it could not be done.	1. Check the peripheral circuit of Flash Memory visually. 2. Confirm that the voltage is added to the power supply pin. If no voltage is detected, replace the Flash Memory because it might be defect. 3. Solder the Flash Memory again.
E 3 E 9	When the adjustment data was checked, an error was detected. (The adjustment data may not be written.)	
E 7	The defect of synthesized voice was detected. (The synthesized voice may not be written.)	
E 2	The defect of Flash Memory was detected.	When Flash Memory has the fatal detect, replace Flash Memory. This error hardly occurs.
E 4	The defect of DSP was detected. (The chip in DSP may have a defect.)	1. Confirm Pins of DSP or resoldering. 2. Confirm the oscillation frequency of DSP. If no frequency is found, replace DSP because it might be defect.
E 5 E 6	The defect of DSP was detected.	Replace DSP.

NOTE:
Flash Memory are IC300 and IC306.
DSP is IC201.

6.3. Check Record

Not record Greeting Message

| Check signal at MICP, when Mic input signal. | NO → | Check MIC, R401, C402, R402, R405. **Greeting Recording Circuit.** |

OK ↓

| Check signal at pin 46 and 47 of IC201, when Mic input signal. | NO → | Check C403, C404, R403, R404. **Greeting Recording Circuit.** |

YES ↓

| Check IC201 and IC300, IC306. |
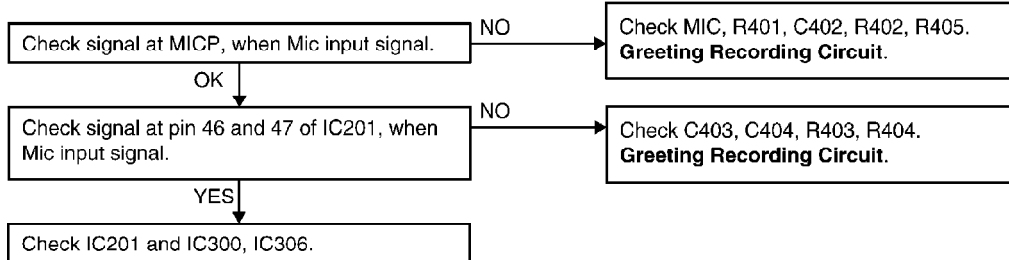
Not record Incoming Message

| Check signal at pin 27 of IC201, when Bell signal. | NO → | Check R2, R3, R4, C2, C3, C4, D3, Q1, R5. **Telephone Line Interface** [Bell]. |

OK ↓

| Does the unit catch line? | NO → | Check Q103, Q104, R108, R109, R111. **Telephone Line Interface.** |

YES ↓

| Check signal pin 36 of IC201. | NO → | Check **ICM Recording Circuit.** |

OK ↓

| Check **Auto Disconnect Circuit.** |

OK ↓

| Check **Parallel Connection Detection Circuit.** |

OK ↓

| Check IC201 and IC300, IC306. |

Cross Reference:
Greeting Recording Circuit ()
Telephone Line Interface ()
ICM Recording Circuit ()

NOTE:
Flash Memory are IC300 and IC306.
DSP is IC201.

6.4. Check Playback

```
┌─────────────────────────────┐   NO   ┌──────────────────────────────┐
│ Is pin 32 of IC201 voltage 3.3 V? │ ─────▶ │ Check D305, C311, C312.      │
└─────────────────────────────┘        │ Power Supply Circuit.        │
               │ OK                     └──────────────────────────────┘
               ▼
┌─────────────────────────────┐   NO   ┌──────────────────────────────┐
│ Check pin 29, 31 of IC201 signal. │ ─────▶ │ Check IC201 and IC300, IC306. │
└─────────────────────────────┘        └──────────────────────────────┘
               │ OK
               ▼
┌─────────────────────────────┐
│ Check speaker.              │
└─────────────────────────────┘
```
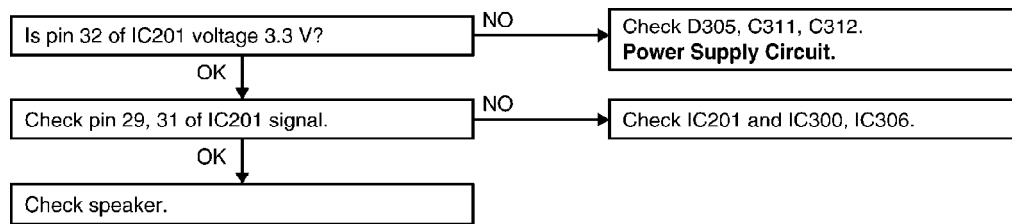
Cross Reference:
Power Supply Circuit ()

NOTE:
Flash Memory are IC300 and IC306.
DSP is IC201.

6.5. Check Sp-phone Voice Transmission

```
┌─────────────────────────────────────┐   NO   ┌──────────────────────────────┐
│ Does the microphone of BASE UNIT Work? │ ─────▶ │ Check around MIC.            │
└─────────────────────────────────────┘        └──────────────────────────────┘
               │ YES
               ▼
┌─────────────────────────────────────┐   NO   ┌──────────────────────────────┐
│ Input signal 1.1kHz/-51dbm to the Microphone │ ─────▶ │ Check C401, C402, R401, R402, R403, │
│ of BASE UNIT and SP-PHONE On, Then check │        │ R404, R405, C403, C404.      │
│ signal is input to pin 46, 47 of IC201.      │        │ SP-PHONE TX circuit.         │
└─────────────────────────────────────┘        └──────────────────────────────┘
               │ YES
               ▼
┌─────────────────────────────────────┐   NO   ┌──────────────────────────────┐
│ Is there an output signal at pin 34 of IC201? │ ─────▶ │ Check IC201.                 │
└─────────────────────────────────────┘        └──────────────────────────────┘
               │ YES
               ▼
┌─────────────────────────────────────┐   NO   ┌──────────────────────────────┐
│ Is there an output signal at base of Q106? │ ─────▶ │ Check SP-PHONE TX circuit.   │
└─────────────────────────────────────┘        └──────────────────────────────┘
               │ YES
               ▼
┌─────────────────────────────────────┐   NO   ┌──────────────────────────────┐
│ Is there an output signal at T/R?   │ ─────▶ │ Check Telephone Line Intorface. │
└─────────────────────────────────────┘        └──────────────────────────────┘
               │ YES
               ▼
┌─────────────────────────────────────┐
│ Check TEL code.                     │
└─────────────────────────────────────┘
```

Cross Reference:
SP-PHONE TX Circuit ()
Telephone Line Interface ()

NOTE:
Flash Memory are IC300 and IC306.
DSP is IC201.

6.6. Check Sp-phone Voice Reception

```
┌─────────────────────────────────┐   NO   ┌─────────────────────────────────┐
│ Input 1.1kHz/-25dbm to TEL line │───────▶│ Check Q103, Q104, R108, R109,   │
│ and push SP-PHONE of Base Unit. │        │ R111.                           │
│ Does the unit catch line?       │        │ Telephone Line Interface.       │
└─────────────────────────────────┘        └─────────────────────────────────┘
              │ YES
              ▼
┌─────────────────────────────────┐   NO   ┌─────────────────────────────────┐
│ Check pin 36 of IC201 signal.   │───────▶│ Check SP-PHONE RX circit.       │
└─────────────────────────────────┘        └─────────────────────────────────┘
              │ YES
              ▼
┌─────────────────────────────────┐   NO   ┌─────────────────────────────────┐
│ Check pin 29, 31 of IC201       │───────▶│ Check IC201.                    │
│ signal.                         │        └─────────────────────────────────┘
└─────────────────────────────────┘
              │ YES
              ▼
┌─────────────────────────────────┐
│ Check speaker.                  │
└─────────────────────────────────┘
```
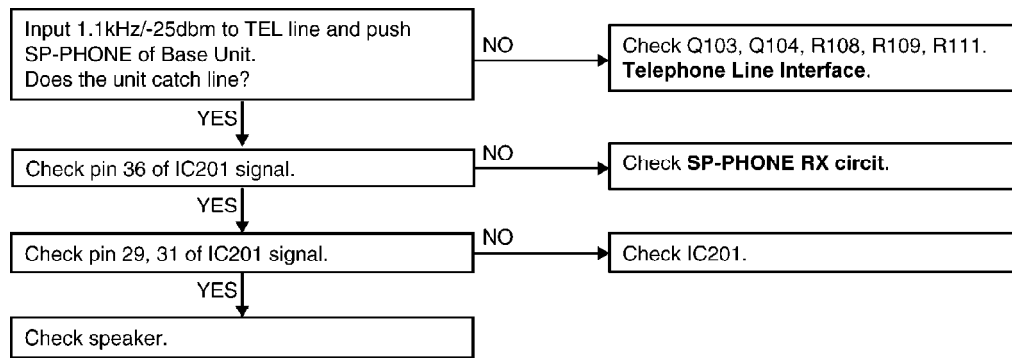
Cross Reference:
Telephone Line Interface ()
SP-PHONE RX Circuit ()

NOTE:
Flash Memory are IC300 and IC306.
DSP is IC201.

6.7. Check Handset Voice Transmission

```
┌─────────────────────────────────┐   NO   ┌─────────────────────────────────┐
│ Does the microphone of: handset │───────▶│ Check around MIC.               │
│ Work?                           │        └─────────────────────────────────┘
└─────────────────────────────────┘
              │ YES
              ▼
┌─────────────────────────────────┐   NO   ┌─────────────────────────────────┐
│ Input signal 1.1kHz/-40dbm to   │───────▶│ Check Q410, R410~R415,          │
│ the Microphone of handset and   │        │ C410~C414.                      │
│ off-hook then check signal is   │        │ Handset TX circuit.             │
│ input to pin 44 of IC201.       │        └─────────────────────────────────┘
└─────────────────────────────────┘
              │ YES
              ▼
┌─────────────────────────────────┐   NO   ┌─────────────────────────────────┐
│ Is there an output signal at    │───────▶│ Check IC201.                    │
│ pin 34 of IC201?                │        └─────────────────────────────────┘
└─────────────────────────────────┘
              │ YES
              ▼
┌─────────────────────────────────┐   NO   ┌─────────────────────────────────┐
│ Is there an output signal at    │───────▶│ Check Handset TX circuit.       │
│ base of Q106?                   │        └─────────────────────────────────┘
└─────────────────────────────────┘
              │ YES
              ▼
┌─────────────────────────────────┐   NO   ┌─────────────────────────────────┐
│ Is there an output signal at    │───────▶│ Check Telephone Line Interface. │
│ T/R?                            │        └─────────────────────────────────┘
└─────────────────────────────────┘
              │ YES
              ▼
┌─────────────────────────────────┐
│ Check TEL code.                 │
└─────────────────────────────────┘
```

Cross Reference:
Handset TX Circuit ()
Telephone Line Interface ()

NOTE:
Flash Memory are IC300 and IC306.
DSP is IC201.

6.8. Check Handset Voice Reception

```
┌─────────────────────────────────┐   NO   ┌──────────────────────────────────┐
│ Input 1.1kHz/-20dbm to TEL line  │──────▶│ Check Q103, Q104, R108, R109, R111.│
│ and off-hook.                    │       │ Telephone Line Interface.        │
│ Does the unit catch line?        │       └──────────────────────────────────┘
└─────────────────────────────────┘
              │ YES
              ▼
┌─────────────────────────────────┐   NO   ┌──────────────────────────────────┐
│ Check pin 36 of IC201 signal.    │──────▶│ Check Handset RX ciruit.         │
└─────────────────────────────────┘       └──────────────────────────────────┘
              │ YES
              ▼
┌─────────────────────────────────┐   NO   ┌──────────────────────────────────┐
│ Check pin 33 of IC201 signal.    │──────▶│ Check IC201.                     │
└─────────────────────────────────┘       └──────────────────────────────────┘
              │ YES
              ▼
┌─────────────────────────────────┐   NO   ┌──────────────────────────────────┐
│ Is there an output signal to     │──────▶│ Check Handset RX ciruit.         │
│ CN401?                           │       └──────────────────────────────────┘
└─────────────────────────────────┘
              │ YES
              ▼
┌─────────────────────────────────┐
│ Check handset.                   │
└─────────────────────────────────┘
```
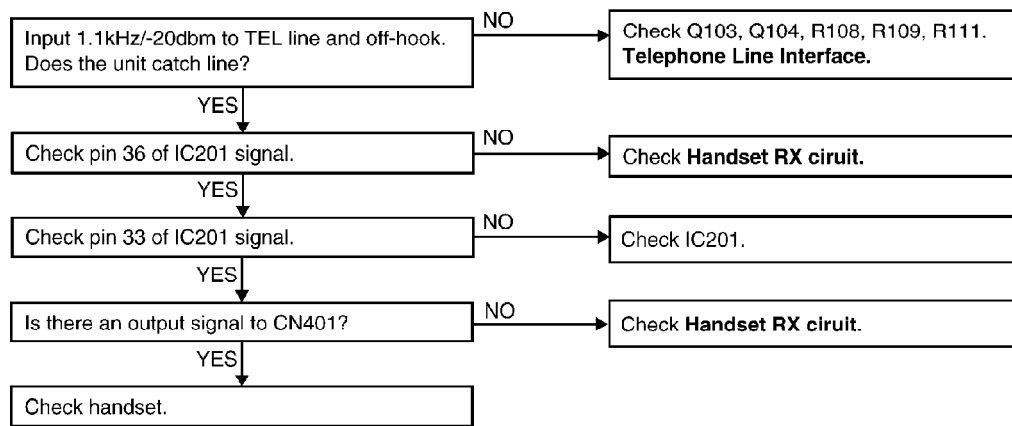
Cross Reference:
Telephone Line Interface ()
Handset RX Circuit ()

NOTE:
Flash Memory are IC300 and IC306.
DSP is IC201.

6.9. Check Call ID

```
┌──────────────────────┐  NO   ┌──────────────────────┐  NO   ┌──────────────────────┐
│ Did bell ring?        │─────▶│ Check Q1, D3, C2, C3, C4,│────▶│ Is pin 27 of IC201    │
│ (Message indicator     │      │ R2, R3, R4, R5.       │      │ input the bell signal?│
│  blinks).             │      └──────────────────────┘      └──────────────────────┘
└──────────────────────┘
          │ YES
          ▼
┌──────────────────────┐  NO   ┌──────────────────────────────┐
│ Was Caller ID signal  │─────▶│ Caller ID data is not send from│
│ ((A)) sent            │      │ Telephone Exchange. Contact to│
│ between 1st bell and   │      │ Telephone company so as to send│
│ 2nd bell between Tip   │      │ the caller ID data.          │
│ and Ring?             │      └──────────────────────────────┘
└──────────────────────┘
          │ YES
          ▼
┌──────────────────────┐  NO   ┌──────────────────────┐
│ Is pin 38 of IC201     │─────▶│ Check around C181, C182,│
│ sent the signal ((A))? │      │ R181, R182.          │
└──────────────────────┘      └──────────────────────┘
          │ YES
          ▼
┌──────────────────────┐
│ Check around C183, R183,│
│ R184~R186, C184, C185. │
└──────────────────────┘
```

(A) DATA in

1200Hz =DATA "0"   2200Hz =DATA "1"

Cross Reference:
Calling Line Identification Circuit (Caller ID) ()

NOTE:
Flash Memory are IC300 and IC306.

DSP is IC201.

7. TEST MODE

ITS TEST MODE
(Power source of set is off)
1) Press "1", "9", and "⁎" simultaneously, then turn power on.
SP-PHONE LED flashes.
2) Release the button.
Sound beeps then test mode starts.
SP- PHONE LED goes out.
LCD particular display.
Tel Line is ON.

[Cancellation]
Turn power off.
TEST MODE is supposed to be factory default.

Specifications of test mode for conservation
[Default]
SP-PHONE volume : MAX
Handset volume : MAX
Headset volume : MaX
Function table of test mode for conservation
Item   Purpose(confirmation item)   Setting Method note
An order of pushing a button.
NAVI key.
∧ ⟶ V ⟶ < ⟶ V
Except NAVI key.
From MUTE
1. LCD check / While buttons are pressed except SP-PHONE LCD all flashes.
   It displays particular letter at STANDBY state.
   It displays checksum in four figures right under LCD.

2. Buttons check   LED check / At key check state , if you press the buttons except SP-PHONE LED⋯
   • Sound beeps
   • SP-LED flashes while pressing
   • LCD all flashes while pressing

8. BLOCK DIAGRAM

9. CIRCUIT OPERATION

9.1. SP-PHONE RX Circuit

Circuit Operation:

Telephone Line (T/R) ⟶ **Q106** ⟶ **R160** ⟶ **R161** ⟶ **C160** ⟶ **pin 36 of IC201** ⟶ **pins 29 and 31 of IC201** ⟶ **Speaker.**
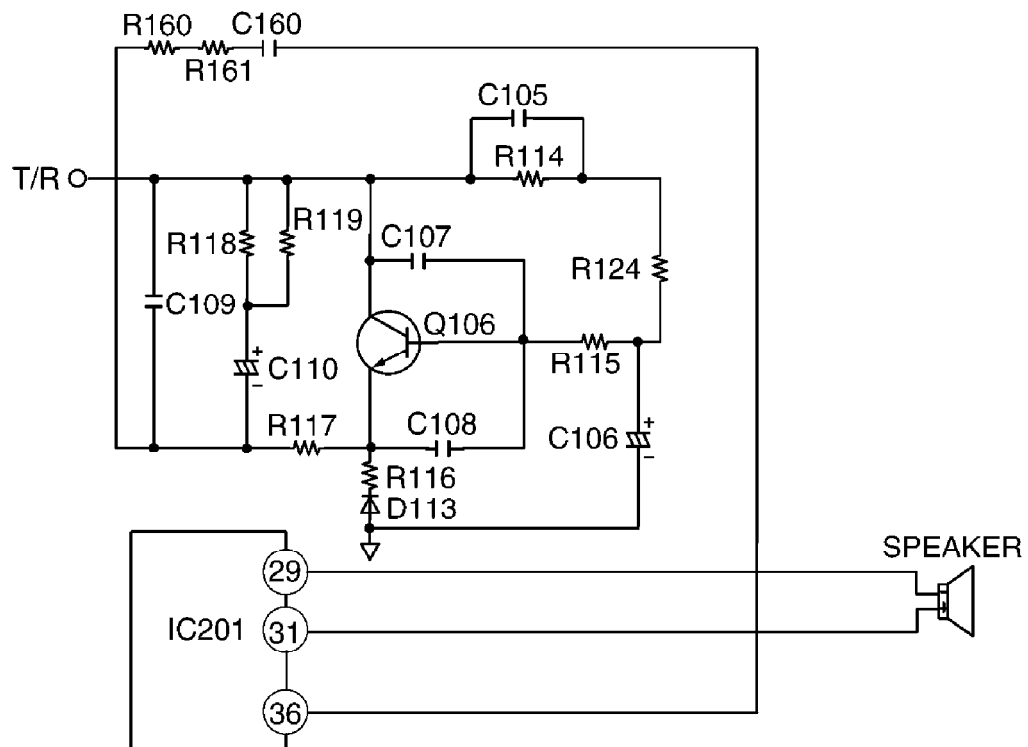
Circuit Diagram

9.2. SP-PHONE TX Circuit

Circuit Operation:

MIC → **C403, R403, C404, R404** → **pins 46 and 47 of IC201** → **pins 34 of IC201** → **R152, C151, R151** → **Q106** → **Telephone Line.**

Circuit Diagram
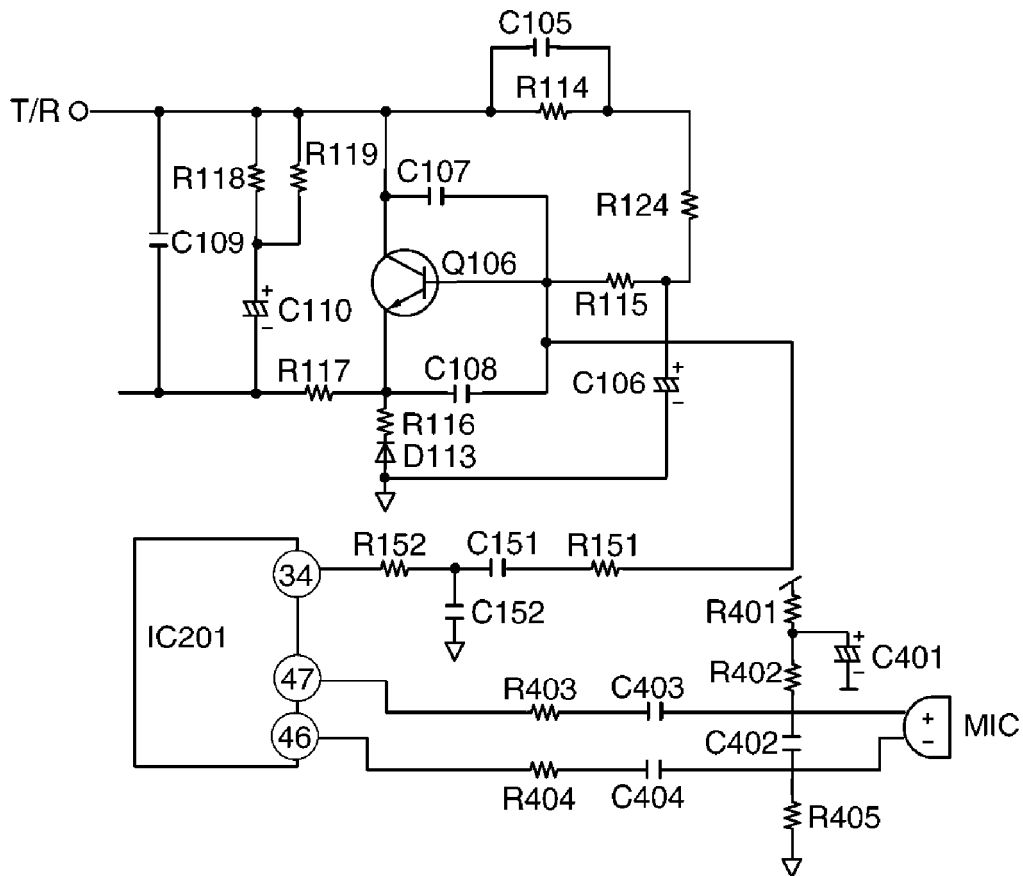
9.3. Auto Disconnect Circuit

Function:

This circuit is used to detect the fact that another telephone connected to the same line is OFF-HOOK while the unit is in a receiving status or OGM transmitting status.

Circuit Operation:

The voltage pin 35 of IC201 is monitored. If a parallel-connected telephone is put into an OFF HOOK status, the presence/absence of a parallel connection is determined when the voltage changes by 0.2V or more.

When the set detects the parallel-connected telephone is OFF HOOK status, the line is disconnected.

Circuit Diagram
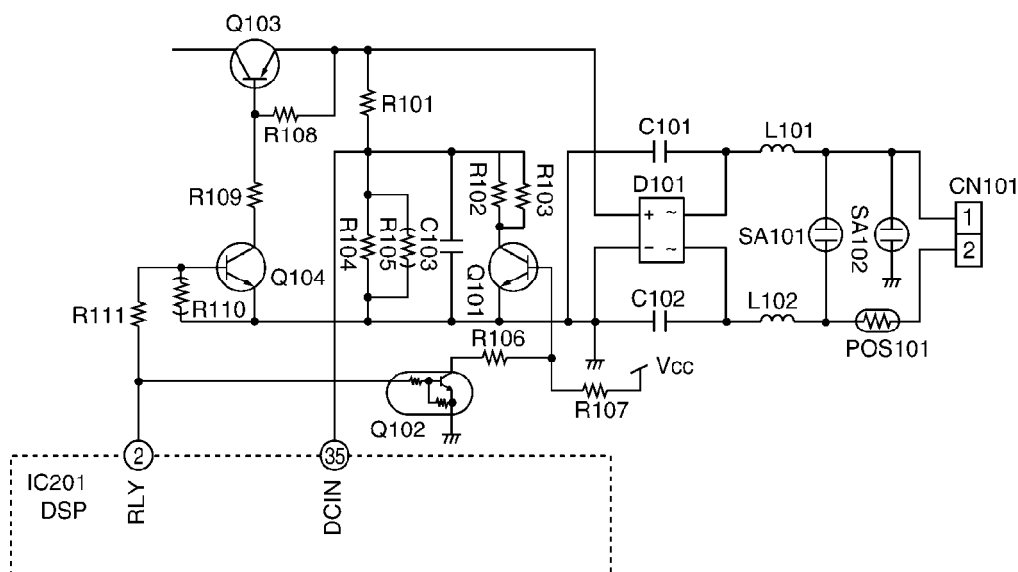
9.4. Power Supply Circuit

Function:
Power from the AC adaptor passes through a regulating block consisting of IC303.
Circuit Operation:
Q301 is a regulated power supply. The voltage at point A is regulated to 3.6 V by IC303.
The voltage at point B is dropped by D303 and L301 to 3.3V.
The voltage at point C is dropped by D304 to 3.3V.
The voltage at point D is dropped by D305 to 3.3V.

Circuit Diagram
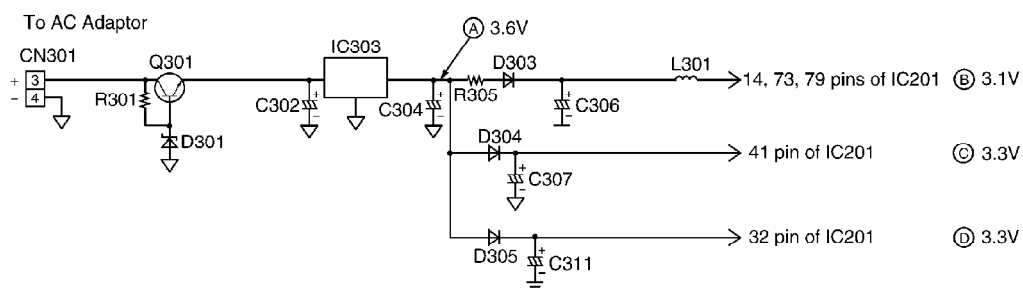
9.5. DTMF Signal

When the DTMF data from the Handset is received, the DTMF signal is output from pin 34 of IC201 and sent to the line through Q106.

9.6. Handset TX Circuit

MIC → C411 → R411 → R412 → C413 → Q410 → C414 → 44 pin of IC201 → 34 pin of IC201 → R152 → C151 → R151 →

Q106 → T/R.

Circuit Diagram
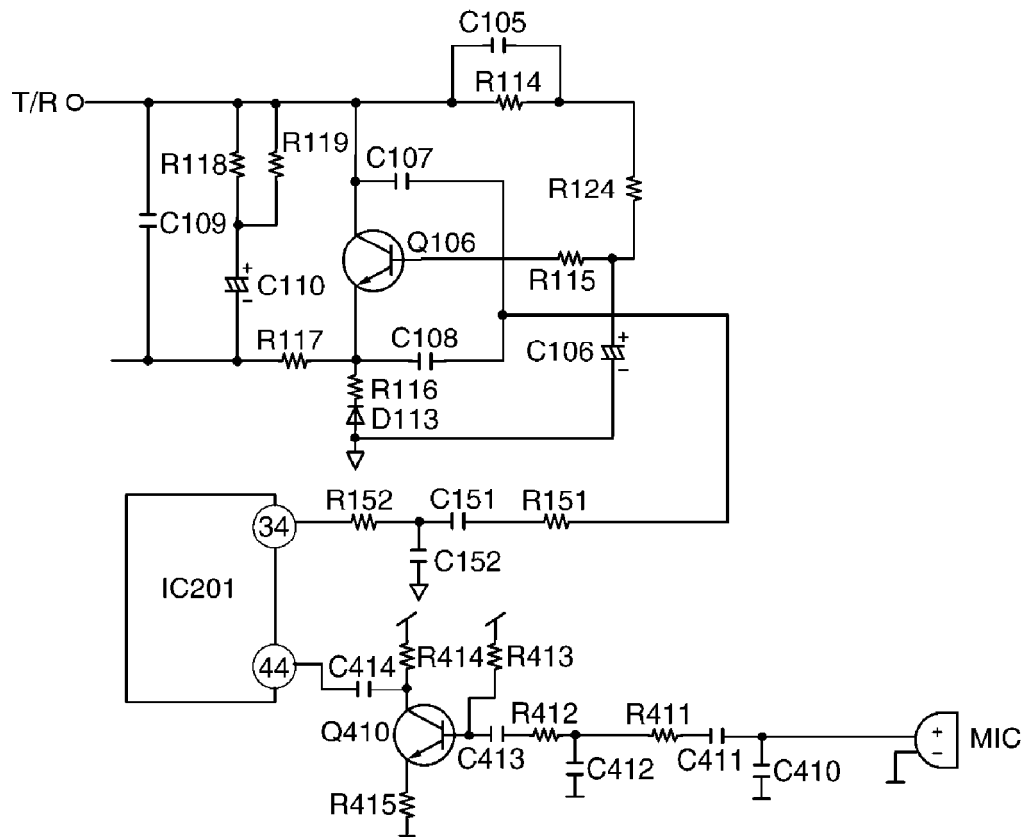
9.7. Handset RX Circuit

T/R → Q106 → R160 → R161 → C610 → 36 pin of IC201 → 33 pin of IC201 → C421 → R422 → R427 →

Q422 → C426 → SP.

Circuit Diagram
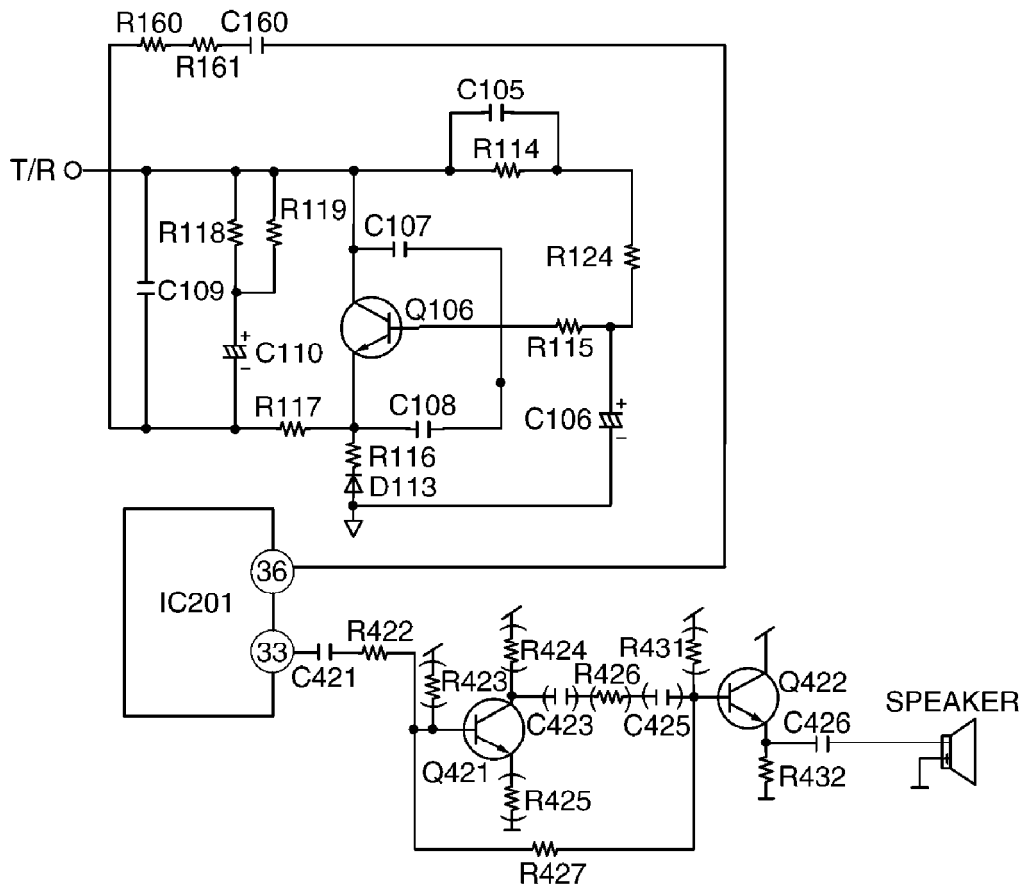
9.8. Calling Line Identification Circuit (Caller ID)

Function:

The caller ID is a chargeable ID which the user of a telephone circuit obtains by entering a contract with the telephone company to utilize a caller ID service. For this reason, the operation of this circuit assumes that a caller ID service contract has been entered for the circuit being used.

The data for the caller ID from the telephone exchange is sent during the interval between the first and second rings of the bell signal. The data from the telephone exchange is a modem signal which is modulated in an FSK (Frequency Shift Keying) format. Data "0" is a 1200 Hz sine wave, and data "1" a 2200 Hz sine wave.

There are two type of the message format which can be received: i.e. the single message format and plural message format. The plural message format allows to transmit the name and data code information in addition to the time and telephone number data.

● Single message format

month		day		hour		minute		number
04	–	15	–	16	–	35	–	2013487000

● Plural message format

DATA CODE	NAME
201	John Smith

month		day		hour		minute		number
04	–	16	–	16	–	35	–	2013487000
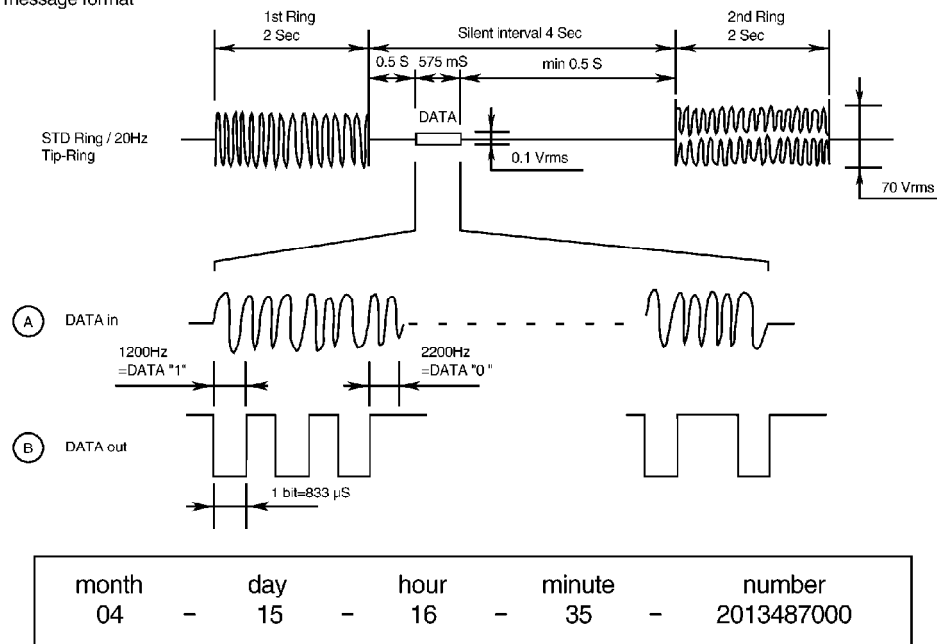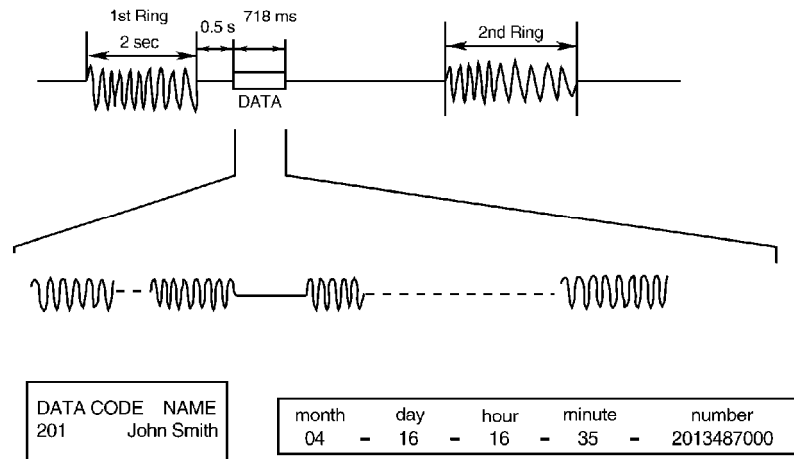
Call Waiting

Calling Identity Delivery on Call Waiting (CIDCW) is a CLASS service that allows a customer, while off-hook on an existing call, to receive information about a calling party on a waited call. The transmission of the calling information takes place almost immediately after the customer is alerted to the new call so he/she can use this information to decide whether to take the new call.

Function:

The CAS signal flows from T/R → C181, C182 → R181, R182 → IC201 pins 38~40 and the ACK (DTMFsignal) is returned to the telephone exchange. The telephone exchange that received the ACK can send the data in the same manner as the callerID. If the unit deems that a telephone connected in parallel is in use, ACK is not returned even if CAS is received, and the information for the second and subsequent callers is not displayed on the portable handset display.

Call Waiting Format

CAS: CPE Alerting Signal
Dual Tone of 2130 Hz, 2750 Hz
-15 dBm (900 ohm load)

Continuance Signal
of 1200 Hz (Data "1")   "FSK"

Signal Flow
Telephone Exchange → Cordlessphone

| CAS | | MARK | DATA |

80± 5 ms

0~500 ms 58~75 ms   about 300 ms
(be chaged by
Information Volume)

ACK: Acknowledg Signal
DTMF
"D"

Signal Flow
Cordlessphone → Telephone Exchange

| ACK |

0~100 ms 60± 5 ms

Circuit Diagram

VCC
R184
C183
C185
R186
R185
R183
IC201
38
40
39
R181 L101
C181
R182 L102
C182
SA101
POS101
CN101
1 T
2 R

9.9. Parallel Connection Detect Circuit

Function:

In order to disable call waiting and stutter tone functions when using telephones connected in parallel, it is necessary to have a circuit that judges whether a telephone connected in parallel is in use or not. This circuit determines whether the telephone connected in parallel is on hook or off hook by detecting changes in the T/R voltage.

Circuit Operation:

Parallel connection detection when on hook:

When on hook Q101 is ON, the voltage is monitored pin 35 of IC201. There is no parallel connection if the voltage is 1.65 V or higher, while a parallel connection is deemed to exist if the voltage is lower.

Parallel connection detection when off hook:

When off hook Q101 is OFF, the voltage is monitored pin 35 of IC201; the presence/absence of a parallel connection is determined when the voltage changes by 0.2 V or more.

Circuit Diagram
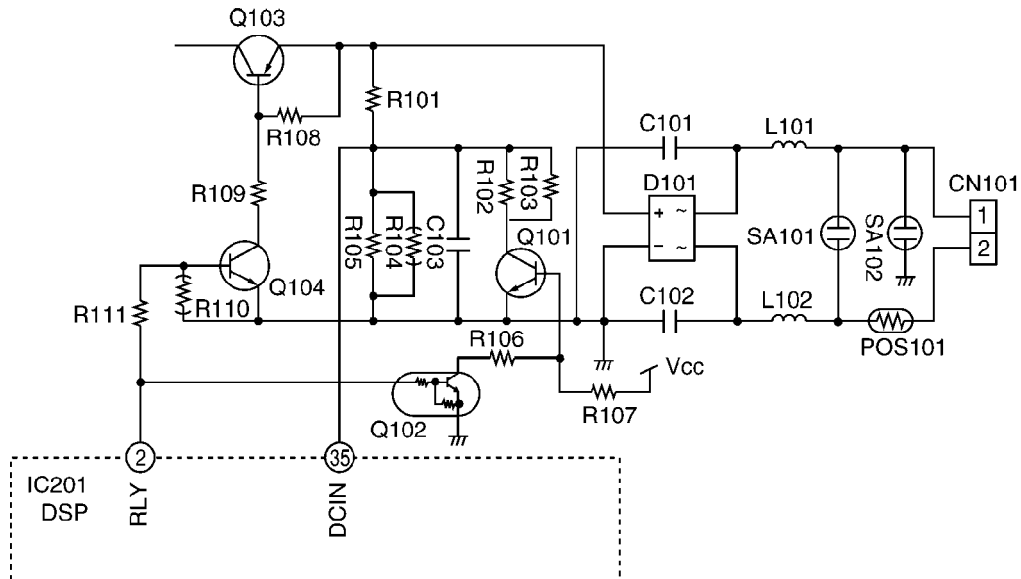
9.10. DSP (Digital Speech/Signal Processing) Circuit

General Description:

(IC201, IC300, IC306) are a digital speakerphone/speech/signal processing system that implements all the functions of speech compression, record and playback, and memory management required in a digital telephone answering machine.

The DSP system is fully controlled by a host processor IC201. The host processor provides activation and control of at that functions, such as speech Recording, Playback, Tone detecting and Line momitoring.

The DSP system comprises of following.

- a Host Processor.
- a Digital Signal Processor which includes the Firmware implemented functions.
- a FLASH MEMORYS (IC300, IC306) which is used for stored voice messages and synthesized voice.

Circuit Diagram
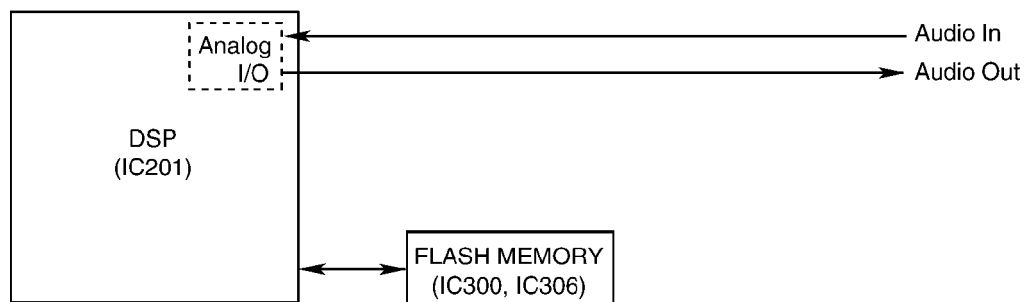
- **Voice Message Recording/Play back**

  The DSP system use a proprietary speech compression technique to record and store voice message in FLASH MEMORY.

  An error correction algorithm is used to enable playback of these messages from the FLASH MEMORYS (IC300, IC306).

- DTMF Detection

The DTMF detection is implemented by the DSP system in software. The DTMF detection is performed during Record, Playback, and Line Monitoring modes of operation.

- Synthesized Voice

The DSP implements synthesized Voice, utilizing the built in speech detector and an FLASH MEMORYS (IC300, IC306), which stored the vocabulary.

- Caller ID and Call Waiting CID demodulation

The DSP implements monitor and demodulate the FSK signals that provide CID information from the Central Office.

9.11. Greeting Recording Circuit

Circuit Operation:

MIC ⇀ C403, C404 ⇀ R403, R404 ⇀ pins 46 and 47 of IC201.

Circuit Diagram
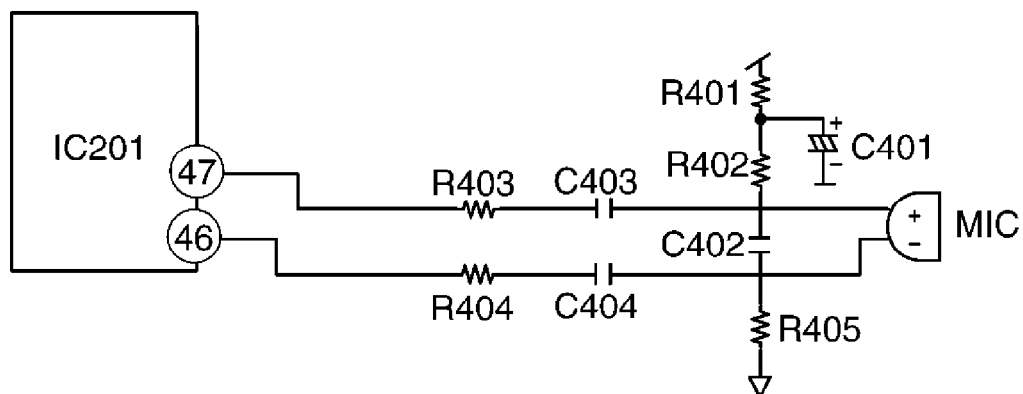
9.12. Greetin Play Back Circuit

Circuit Operation:

Pin 34 of IC201 ⇀ R152 ⇀ C152 ⇀ R151 ⇀ C151 ⇀ Q106 ⇀ Telephone Line.
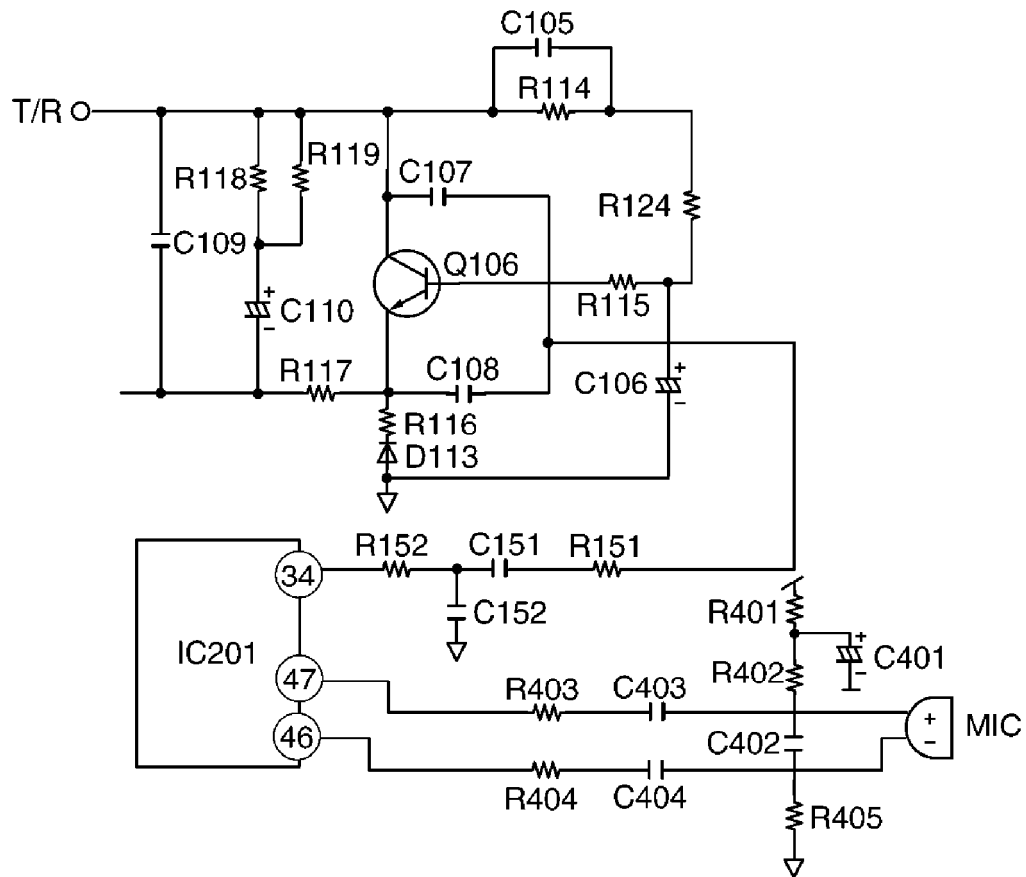
Circuit Diagram

9.13. ICM Recording Circuit

Circuit Operation:

Telephone Line →| **C109** →| **R160** →| **R161** →| **C160** →| **pin 36 of IC201.**

Circuit Diagram
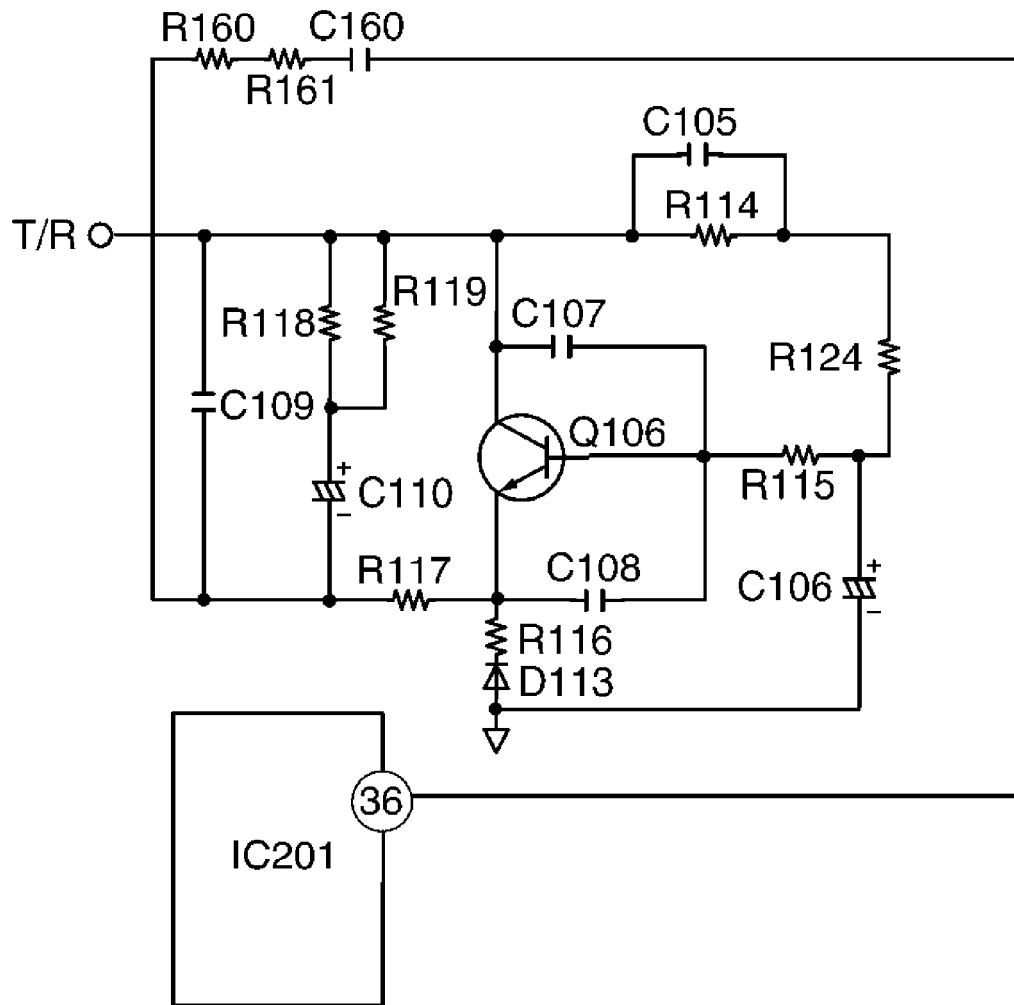
9.14. ICM Play Circuit

Circuit Operation:

Pins 29 and 31 of IC201 → Speaker.

Circuit Diagram
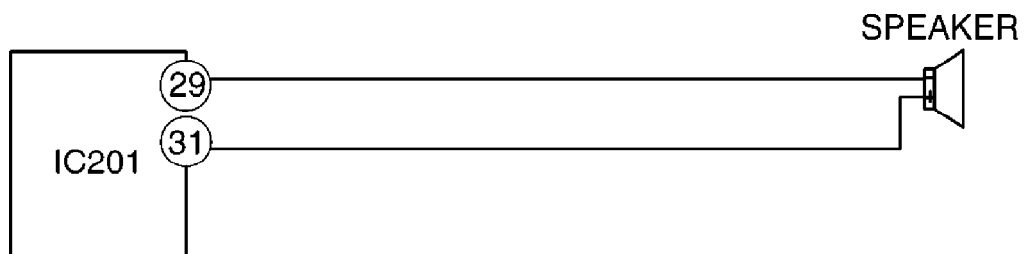
9.15. Telephone Line Interface

Circuit Operation:
ANSWER
In the idle mode, Q103 is open to cut the DC loop current and decrease the ring load. When ring

voltage appears at the Tip (T) and Ring (R) leads (When the telephone rings), the AC ring voltage is transferred as follows:

T → L101 → R2 → C2 → Q1 → IC201 pin 27.

When the CPU (DSP) detects a ring signal, Q103 turns on, thus providing an off-hook condition (active DC current flow through the circuit) and the following signal flow is for the voice signal.

T → D101 → Q103 → R119 → C110 → R117 → R116 → D103 → D101 → L102 → P0S101 → R.

ON HOOK Circuit:

Q103 is open, Q103 is connected as to cut the DC loop current and to cut the voice signal. The unit is consequently in an on-hook condition.

SPECIFICATIONS

In the on-hook state (idle), the current flows between the telephone line and the unit is as follows:

T → L101 → R2 → C2 → R4 → C3 → R2 → L102 → R.

The DC component is blocked by C2, C3: thereby providing an on-hook condition.

The AC interface impedance is over 100k Ω; thus, satisfying the telephone company requirements.
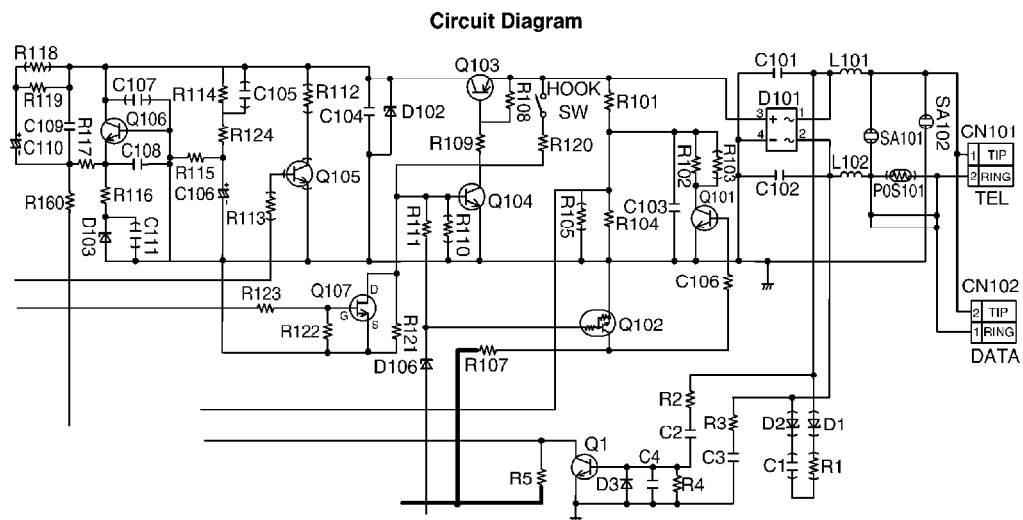
Circuit Diagram

9.16. Initializing Circuit

Function:

This circuit is used for to initialize the microcomputer when it incorporates an AC adaptor.

Circuit Operation:

The set can operate beyond point A in the circuit voltage diagram.

Circuit Diagram
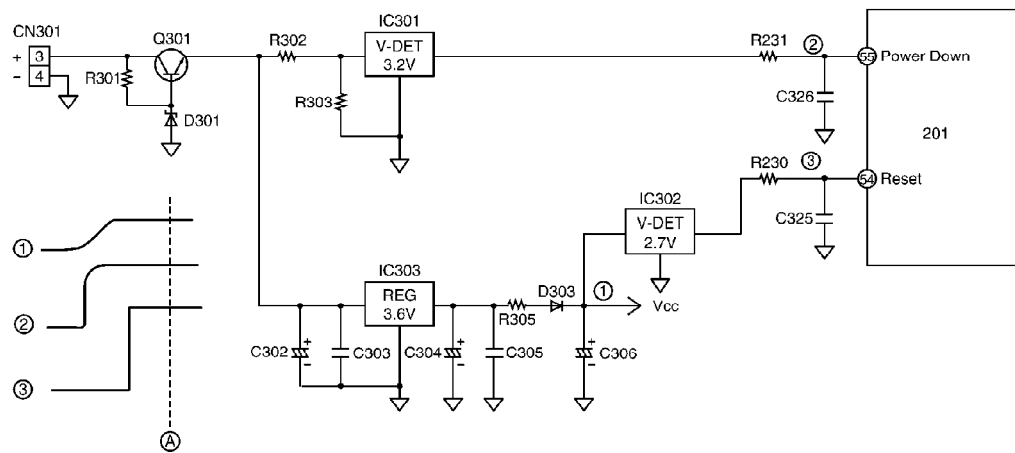
10. CPU DATA

10.1. IC201
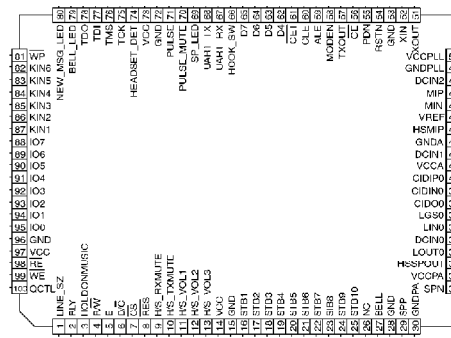
Pin	Description	I/O	High	High_Z	Low
1	LINE_SZ	D.O	On	-	Off
2	RLY	D.O	On	-	Off
3	HOLD_MUSIC	D.O	On	-	Off
4	R/W	D.O	Read	-	Write
5	E	D.O	Active	-	Not
6	D/C̄	D.O	Data	-	Command
7	C̄S̄	D.O	Not	-	Active
8	R̄ĒS̄	D.O	Not	-	Active
9	H/S RX_MUTB	D.O	On	-	Off
10	H/S TX_MUTB	D.O	On	-	Off
11	H/S VOL 1	D.O	High	-	Low
12	H/S VOL 2	D.O	High	-	Low
13	H/S VOL 3	D.O	High	-	Low
14	VCC	VCC	Vcc	-	-
15	GND	GND	-	-	GND
16	STB 1	D.O	Active	Not	-
17	STB 2	D.O	Active	Not	-
18	STB 3	D.O	Active	Not	-
19	STB 4	D.O	Active	Not	-
20	STB 5	D.O	Active	Not	-
21	STB 6	D.O	Active	Not	-
22	STB 7	D.O	Active	Not	-
23	STB 8	D.O	Active	Not	-
24	STB 9	D.O	Active	Not	-
25	STB 10	D.O	Active	Not	-
26	NC	D.O	-	-	Normal
27	BELL	D.I	Off	-	On
28	GND	GND	-	-	GND
29	SPP	A.O	-	-	-
30	GNDPA	GND	-	-	GND
31	SPN	A.O	-	-	-
32	VCCPA	VCC	VCC	-	-
33	HSSPOUT	A.O	-	-	-
34	LOUT0	A.O	-	-	-
35	DCIN0	A.I	-	-	-
36	LIN0	A.I	-	-	-
37	LGS0	A.I	-	-	-
38	CID00	A.I	-	-	-
39	CIDIN0	A.I	-	-	-
40	CIDIP0	A.I	-	-	-
41	VCCA	VCC	VCC	-	-
42	DCIN1	A.I	-	-	-
43	GNDA	GND	-	-	GND
44	HSMIP	A.I	-	-	-
45	VREF	A.O	-	-	-
46	MIN	A.I	-	-	-
47	MIP	A.I	-	-	-
48	DCIN2	A.I	-	-	-
49	GNDPLL	GND	-	-	GND
50	VCCPLL	VCC	VCC	-	-

Pin	Description	I/O	High	High_Z	Low
51	XOUT	A.O	-	-	-
52	XIN	A.I	-	-	-
53	GND	GND	-	-	GND
54	RSTN	D.I	Normal	-	Reset
55	PDN	D.I	Power On	-	Power Down
56	CE	D.O	Not	-	Active
57	TXOUT	D.O	-	-	Normal
58	MODEN	D.I	-	-	Normal
59	ALE	D.O	Latch	-	Not
60	CLE	D.O	Latch	-	Not
61	C̄Ē1	D.O	Not	-	Active
62	D4	D.O	High	-	Low
63	D5	D.O	High	-	Low
64	D6	D.O	High	-	Low
65	D7	D.O	High	-	Low
66	HOOK_SW	D.I	On	-	Off
67	UART_RX	D.I	High	-	Low
68	UART_TX	D.O	High	-	Low
69	SP_LED	D.O	-	Off	On
70	PULSE_MUTE	D.O	On	-	Off
71	PULSE	D.O	On	-	Off
72	GND	GND	-	-	GND
73	VCC	VCC	VCC	-	-
74	HEADSET_DET	D.I	On	-	Off
75	TCK	D.O	-	-	-
76	TMS	D.O	-	-	-
77	TDI	D.I	-	-	-
78	TDO	D.O	-	-	-
79	BELL_LED	D.O	-	Off	On
80	NEW_MSG_LED	D.O	Off	-	On
81	W̄P̄	D.O	Off	-	On
82	KIN6	D.I	Key In	-	Non
83	KIN5	D.I	Key In	-	Non
84	KIN4	D.I	Key In	-	Non
85	KIN3	D.I	Key In	-	Non
86	KIN2	D.I	Key In	-	Non
87	KIN1	D.I	Key In	-	Non
88	IO7	D.O	High	-	Low
89	IO6	D.O	High	-	Low
90	IO5	D.O	High	-	Low
91	IO4	D.O	High	-	Low
92	IO3	D.O	High	-	Low
93	IO2	D.O	High	-	Low
94	IO1	D.O	High	-	Low
95	IO0	D.O	High	-	Low
96	GND	GND	-	-	GND
97	VCC	VCC	VCC	-	-
98	R̄Ē	D.O	Not	-	Active
99	W̄Ē	D.O	Not	-	Active
100	OCTL	D.O	-	-	Normal

11. FLASH MEMORY

11.1. IC300, IC301

```
       ┌──────┐
    1 │ VSS   VCC │ 44
    2 │ CLE    C̄Ē │ 43
    3 │ ALE    R̄Ē │ 42
    4 │ W̄Ē    R/B̄ │ 41
    5 │ W̄P    GND │ 40
    6 │ N.C.  N.C. │ 39
    7 │ N.C.  N.C. │ 38
    8 │ N.C.  N.C. │ 37
    9 │ N.C.  N.C. │ 36
   10 │ N.C.  N.C. │ 35
   11 │            │ 34
   12 │            │ 33
   13 │ N.C.  N.C. │ 32
   14 │ N.C.  N.C. │ 31
   15 │ N.C.  N.C. │ 30
   16 │ N.C.  N.C. │ 29
   17 │ N.C.  N.C. │ 28
   18 │ I/O0  I/O7 │ 27
   19 │ I/O1  I/O6 │ 26
   20 │ I/O2  I/O5 │ 25
   21 │ I/O3  I/O4 │ 24
   22 │ VSS   VCC │ 23
       └──────┘
```
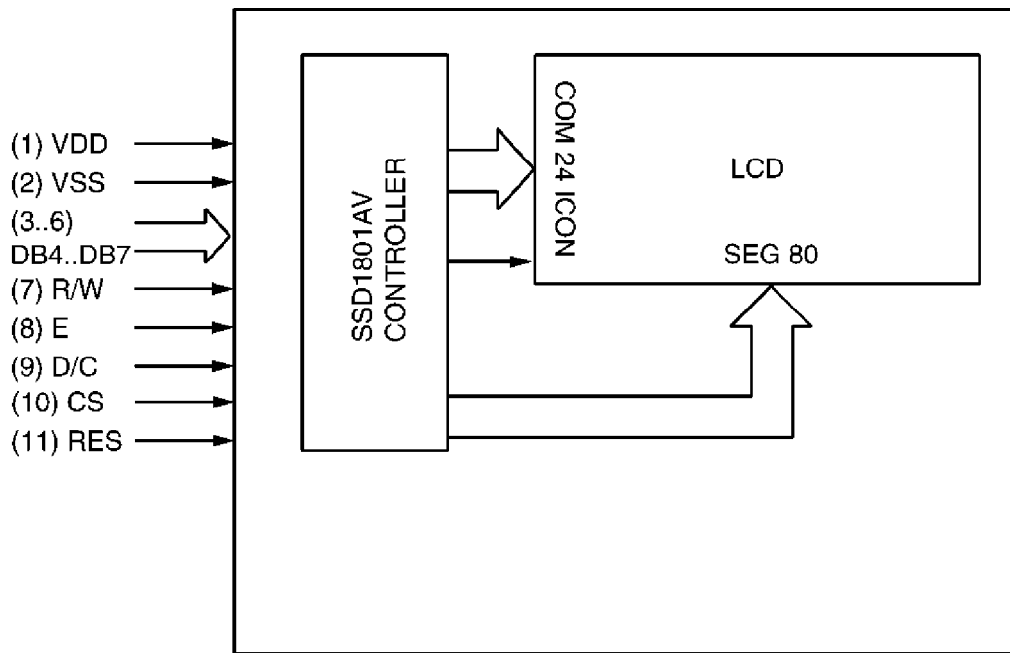
PIN DESCRIPTION

Pin Name	Pin Function	Pin Description
I/O0~I/O7	Data Inputs/Outputs	The I/O pins are used to input command, address and data, and to output data during read operations. The I/O pins flat to high-z when the chip is deselected or when the outputs are disabled.
CLE	Command Latch Enable	The CLE input controls the path activation for commands sent to the command register. When active high, commands are latched into the command register through the I/O ports on the rising dege of the $\overline{WE}$ signal.
ALE	Address Latch Enable	The ALE input controls the path activation for address and input data to the internal address/data register. Addresses are latched on the rising edge of $\overline{WE}$ with ALE high, and input data is latched when ALE is low .
$\overline{CE}$	Chip Enable	The $\overline{CE}$ input is the devica selection control. When $\overline{CE}$ goer high during a read operation the device is returned to standby mode. However, when the device is in the busy state during orogram oe erase, $\overline{CE}$ high is ignored, and doer not retum the device to standby mode.
$\overline{RE}$	Read Enable	The $\overline{RE}$ input is the serial data-out control, and when active drives the data onto the I/O bus. Data is valid tREA(RE accesstime) after the falling edge of RE which aiso increments the internal colurnn address counter by one.
$\overline{WE}$	Write Enable	The $\overline{WE}$ input controls writes to the I/O port. Commands, address and data are latched on the rising edge of the $\overline{WE}$ pulse.
$\overline{WP}$	Write Protect	The $\overline{WP}$ pin provides inadvertent writeerase protection during power transltions. The internal high voltage generator is reset when the $\overline{WP}$ pin is active low.
GND	Ground Input	
R/$\overline{B}$	Ready/$\overline{Busy}$	The R/$\overline{B}$ output indicates the status of the device operation. When low, it indicates that a program, erase or random read operation is in process and returns to high state uponcompletion. It is an open drain output and does not float to high-z condltion when the chip is deselected or when outputs are disabled.
Vcc	Power	
Vss	Ground	
N.C	No Connection	

12. MODULE BLOCK DIAGRAM

12.1. LCD MODULE BLOCK

(1) VDD

(2) VSS

(3..6)
DB4..DB7

(7) R/W

(8) E

(9) D/C

(10) CS

(11) RES

SSD1801AV CONTROLLER

COM 24 ICON

LCD

SEG 80

12.2. CONNECTOR PIN ASSIGNMENT

Pin no.	signal	Function	Enable
1	VDD	+3V Power Supply	—
2	VSS	0V Power Supply	—
3	DB4	Data Bus Line	H/L
4	DB5	Data Bus Line	H/L
5	DB6	Data Bus Line	H/L
6	DB7	Data Bus Line	H/L
7	R/W	Read / Write	H/L
8	E	Enable Signal	H
9	D/C	Data / Command Control	H/L
10	CS	Chip Signal	L
11	RES	Reset Signal Input	L

13. HOW TO REPLACE FLAT PACKAGE IC

13.1. Preparation

- SOLDER

  Sparkle Solder 115A-1, 115B-1 or Almit Solder KR-19, KR-19RMA

- Soldering iron

  Recommended power consumption will be between 30 W to 40 W.

  Temperature of Copper Rod 662 ± 50°F (350 ± 10°C)

  (An expert may handle between 60 W to 80 W iron, but beginner
  might damage foil by overheating.)

- **Flux**

  HI115 Specific gravity 0.863.
  (Original flux will be replaced daily.)

13.2. Procedure

1. Temporary fix FLAT PACKAGE IC by soldering on two marked 2 pins.
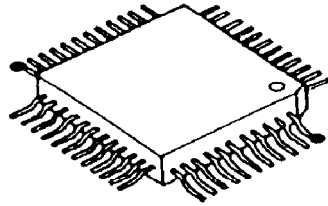
● – – – – – – Temporary soldering point.

*Most important matter is accurate setting of IC to the corresponding soldering foil.

2. Apply flux for all pins of FLAT PACKAGE IC.
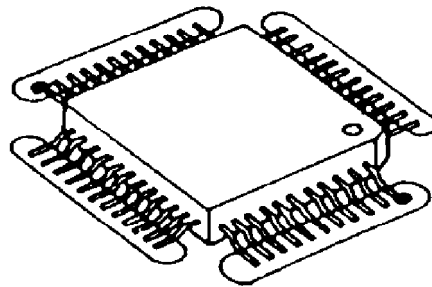
– – – – – Flux

3. Solder employing specified solder to direction of arrow, as sliding the soldering iron.
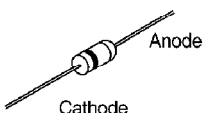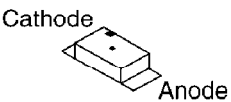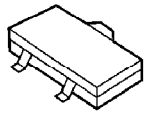
– Soldering iron

– Specified solder
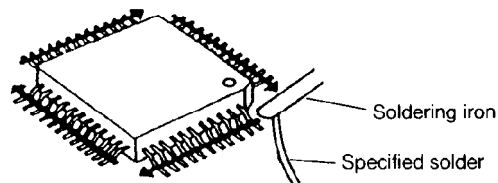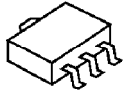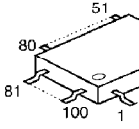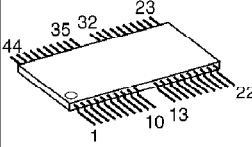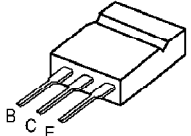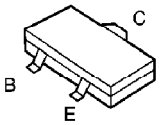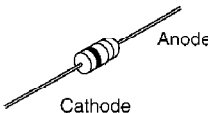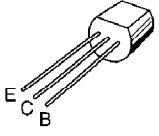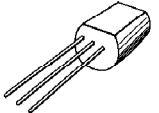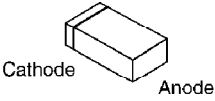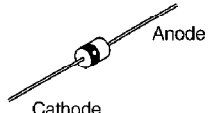
13.3. Modification Procedure of Bridge

1. Re-solder slightly on bridged portion.

**2. Remove remained solder along pins employing soldering iron as shown in below figure.**

bridge
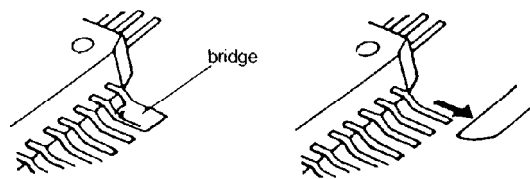
14. TERMINAL GUIDE OF ICs, TRANSISTORS AND DIODES

PQVIPS3432UT	C0CBABD00013	C2HBBJ000016	PQWITMC40BXH PQVIKM29N4TC
2SD2137	2SD1819A, UN5213 PQVTFB1J3P	MA4020	PQVT2N6517CA 2SC2120, 2SA1625
PQVIUM66T11L	MA111, MA8068 PQVDHRU0302A	MA165	MA4180
PSVD1SRCT	PQVDS1ZB60F1	C0EBE0000142	

15. CABINET AND ELECTRICAL PARTS

Actual Size of Screws		
A	XTW26+12P	
B	XTW26+8P	
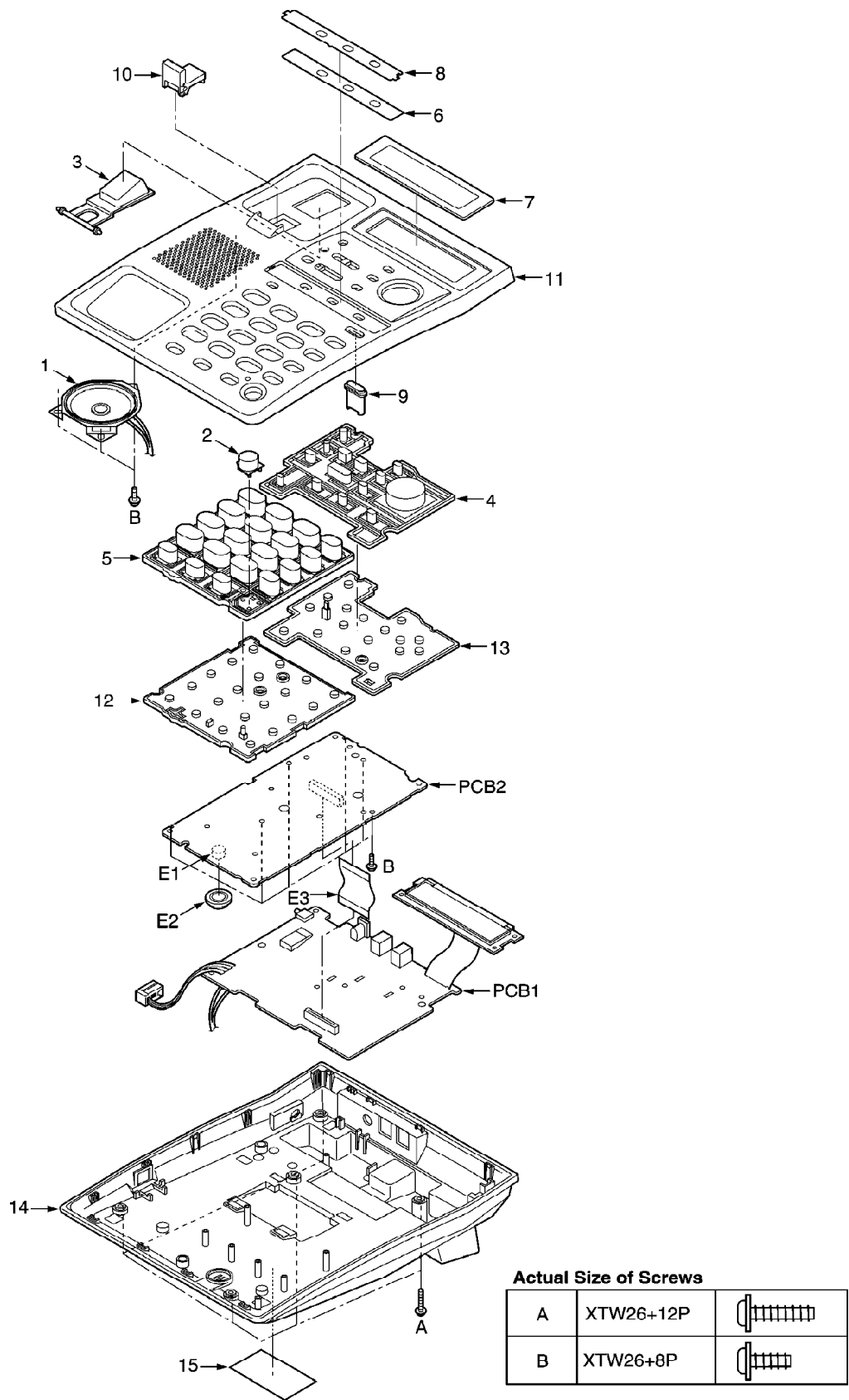
16. ACCESSORIES AND PACKING MATERIALS
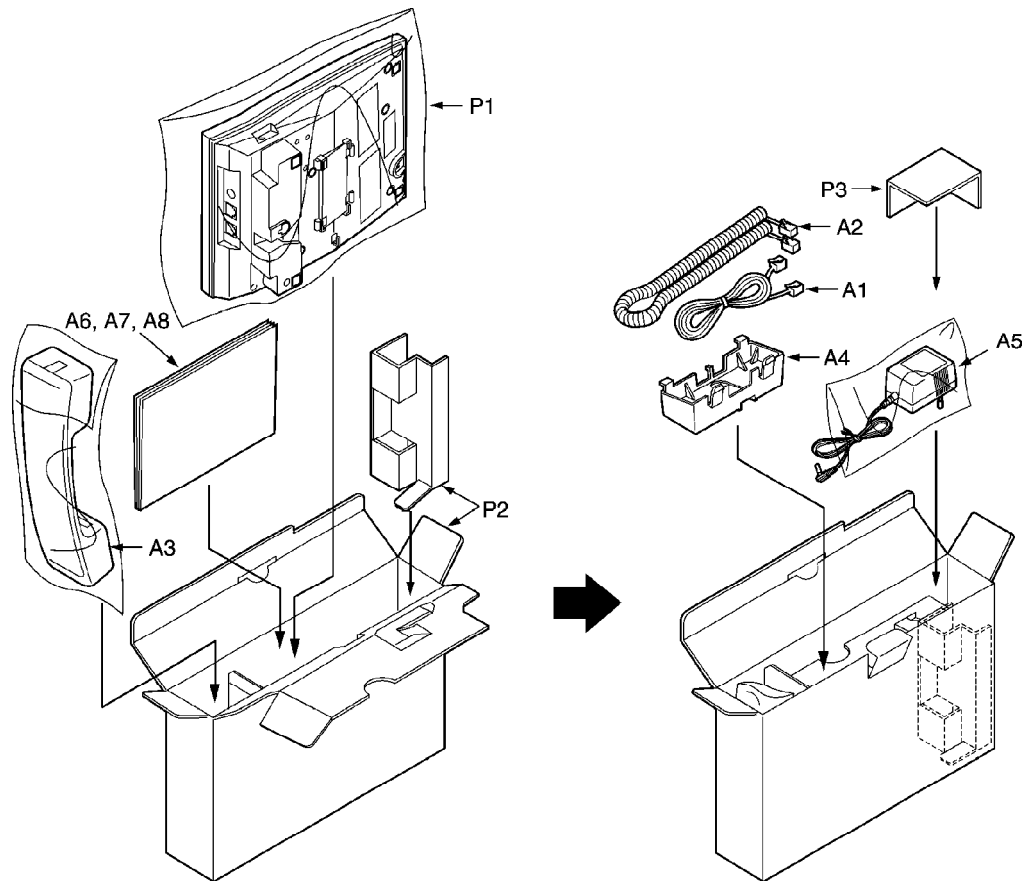
17. REPLACEMENT PARTS LIST

1. RTL (Retention Time Limited)
   Note : The marking (RTL) indicates that the Retention Time is limited for this item.
   After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of availability is depends on the type of assembly, and in accordance with the laws governing parts and product retention.
   After end of this period, the assembly will no longer be available.

2. Important safety notice
   Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacture's specified parts.

3. The S mark means the part is one of some identical parts. For that reason, it may be different from the installed part.

4. ISO code (Example: ABS-94HB) of the remarks column shows quality of the material and a flame resisting grade about plastics.

5. RESISTORS & CAPACITORS

Unless otherwise specified;

All resistors are in ohms (Ω) K=1000 Ω , M=1000k Ω

All capacitors are in MICRO FARADS (μ F) P= μ μ F

*Type & Wattage of Resistor

Type

ERC:Solid	ERX:Metal Film	PQ4R:Carbon
ERD:Carbon	ERG:Metal Oxide	ERS:Fusible Resistor
PQRD:Carbon	ER0:Metal Film	ERF:Cement Resistor

Wattege

10,16:1/8W	14,25:1/4W	12:1/2W	1:1W	2:2W	3:3W

*Type & Voltage of Capacitor

Type

ECFD:Semi-Conductor	ECCD,ECKD,ECBT,PQCBC:Ceramic
ECQS:Styrol	ECQE,ECQV,ECQG:Polyester
PQCUV:Chip	ECEA,ECSZ:Electlytic
ECQMS:Mica	ECQP:Polypropylene

Voltage

ECQ Type	ECQG ECQV Type	ECSZ Type	Others		
1H:50V	05:50V	0F:3.15V	0J :6.3V	1V :35V
2A:100V	1:100V	1A:10V	1A :10V	50,1H:50V
2E:250V	2:200V	1V:35V	1C :16V	1J :63V
2H:500V		0J:6.3V	1E,25:25V	2A :100V

17.1. KX-TMC40JXW

17.1.1. CABINET AND ELECTRICAL PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
1	PQAS57P03Y	SPEAKER	
2	PQBC10347Z1	PUSH BUTTON,SP PHONE	ABS-HB
3	PQBH10023Y3	PUSH BUTTON,HOOK	ABS-HB
4	PQBX10357Z1	PUSH BUTTON,NAVI+13KEY	ABS-HB
5	PQBX10351Z1	PUSH BUTTON,19KEY	ABS-HB
6	PQGD10165Z	SHEET PAPER,TEL CARD	
7	PQGP10203Z1	PANEL,LCD	PC-HB
8	PQGV10042Z	TRANSPARENT PLATE,TEL CARD COVER	PC-HB
9	PQHR10915Z	COVER,LED LENS	PS-HB
10	PQKE10070Z3	HANGER,H/S HOLDER	ABS-HB
11	PQKM10553X1	CABINET,UPPER	ABS-HB
12	PQSX10195Z	KEYBOARD SWITCH,20KEY	
13	PQSX10209Z	KEYBOARD SWITCH,NAVI+13KEY	
14	PQYF10545Y1	CABINET,LOWER	PS-HB
15	PQGT15351Z	NAME PLATE	

17.1.2. MAIN P.C. BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB1	PQWP1TMC40BX	MAIN P.C. BOARD ASS'Y (RTL)	
		(ICS)	
IC201	C2HBBJ000016	IC	
IC300	PQWITMC40BXH	IC	
IC301	PQVIPS3432UT	IC	S
IC302	C0EBE0000142	IC	
IC303	C0CBABD00013	IC	
IC306	PQVIKM29N4TC	IC	
IC901	PQVIUM66T11L	IC	S
		(TRANSISTORS)	
Q1	2SD1819A	TRANSISTOR(SI)	
Q101	2SD1819A	TRANSISTOR(SI)	
Q102	UN5213	TRANSISTOR(SI)	S
Q103	2SA1625	TRANSISTOR(SI)	S
Q104	PQVT2N6517CA	TRANSISTOR(SI)	S
Q106	2SC2120	TRANSISTOR(SI)	S
Q301	2SD2137	TRANSISTOR(SI)	
Q410	2SD1819A	TRANSISTOR(SI)	
Q411	2SD1819A	TRANSISTOR(SI)	
Q422	2SD1819A		
Q427	PQVTFB1J3P	TRANSISTOR(SI)	S
		(DIODES)	
D3	MA111	DIODE(SI)	
D101	PQVDS1YB60F1	DIODE(SI)	S
D102	MA4180	DIODE(SI)	
D103	MA4020	DIODE(SI)	
D104	MA111	DIODE(SI)	
D105	MA111	DIODE(SI)	
D106	MA165	DIODE(SI)	
D301	MA4068	DIODE(SI)	
D303	PQVDHRU0302A	DIODE(SI)	S
D304	PQVDHRU0302A	DIODE(SI)	S
D305	PQVDHRU0302A	DIODE(SI)	S
D307	MA111	DIODE(SI)	
		(COIL)	
L101	PQLQXF330K	COIL	S
L102	PQLQXF330K	COIL	S
L301	PQLQR2KA213	COIL	S
L305	PQLQR2KA213	COIL	S
		(CONNECTOR)	
CN403	PQJS24X54Z	CONNECTOR	S
		(CRYSTAL OSCILLATOR)	
X200	H0D409400014	CRYSTAL OSCILLATOR	
		(JACKS)	
CN101	PQJJ1T008X	JACK, MODULAR	S
CN102	PQJJ1T008X	JACK, MODULAR	S
CN301	PQJJ1B4Y	JACK, DC	
CN401	PQJJ1T030Z	JACK, HANDSET	
CN402	PQJJ1C001Z	JACK, HEADSET	S
		(LCD)	
LCD	L5DCAGC00001	LIQUID CRYSTAL DISPLAY	
		(SWITCHES)	
SW101	PQSH2B105Z	PUSH SWITCH, HOOK	
		(VARISTOR)	

Ref. No.	Part No.	Part Name & Description	Remarks
SA101	PQVDDSS301L	VARISTOR	!S
SA102	PQVDDSS301L	VARISTOR	!S
		(RESISTORS)	
R2	PQ4R10XJ104	100K	S
R3	PQ4R10XJ104	100K	S
R4	ERJ3GEYJ472	4.7K	
R5	ERJ3GEYJ473	47K	
R101	PQ4R10XJ106	10M	S
R102	ERJ3GEYJ225	2.2M	
R104	ERJ3GEYJ275	2.7M	
R106	ERJ3GEYJ472	4.7K	
R107	ERJ3GEYJ563	56K	
R108	PQ4R10XJ104	100K	S
R109	ERDS2TJ472	4.7K	
R111	ERJ3GEYJ473	47K	
R114	ERJ3GEYJ821	820	
R115	ERJ3GEYJ223	22K	
R116	ERDS1TJ560	56	S
R117	ERJ3GEYJ181	180	
R118	ERJ3GEYJ103	10K	
R119	ERJ3GEYJ102	1K	
R124	ERJ3GEY0R00	0	
R151	ERJ3GEYJ183	18K	
R152	ERJ3GEYJ222	2.2K	
R153	ERJ3GEYJ102	1K	
R160	ERJ3GEYJ682	6.8K	
R161	ERJ3GEY0R00	0	
R163	ERJ3GEYJ472	4.7K	
R181	ERJ3GEYJ394	390K	
R182	ERJ3GEYJ394	390K	
R183	ERJ3GEYJ394	390K	
R184	ERJ3GEYJ123	12K	
R185	ERJ3GEYJ394	390K	
R186	ERJ3GEYJ103	10K	
R230	ERJ3GEYJ102	1K	
R231	ERJ3GEYJ102	1K	
R232	ERJ3GEY0R00	0	
R233	ERJ3GEY0R00	0	
R234	ERJ3GEY0R00	0	
R235	ERJ3GEY0R00	0	
R236	ERJ3GEYJ104	100K	
R237	ERJ3GEY0R00	0	
R238	ERJ3GEY0R00	0	
R241	ERJ3GEY0R00	0	
R301	ERDS1TJ181	180	S
R302	ERJ3GEYJ273	27K	
R303	ERJ3GEYJ683	68K	
R304	ERJ3GEYJ103	10K	
R305	PQ4R10XJ120	12	S
R342	ERJ3GEYJ103	10K	
R343	ERJ3GEYJ104	100K	
R345	ERJ3GEYJ103	10K	
R350	ERJ3GEYJ101	100	
R351	ERJ3GEYJ101	100	

Ref. No.	Part No.	Part Name & Description	Remarks
R352	ERJ3GEYJ473	47K	
R353	ERJ3GEYJ472	4.7K	
R354	ERJ3GEYJ472	4.7K	
R355	ERJ3GEYJ472	4.7K	
R356	ERJ3GEYJ472	4.7K	
R361	ERJ3GEYJ391	390	
R362	ERJ3GEYJ391	390	
R363	ERJ3GEYJ391	390	
R401	ERJ3GEYJ101	100	
R402	ERJ3GEYJ222	2.2K	
R403	ERJ3GEYJ102	1K	
R404	ERJ3GEYJ102	1K	
R405	ERJ3GEYJ222	2.2K	
R410	ERJ3GEYJ332	3.3K	
R411	ERJ3GEYJ103	10K	
R412	ERJ3GEYJ683	68K	
R413	ERJ3GEYJ335	3.3M	
R414	ERJ3GEYJ392	3.9K	
R415	ERJ3GEYJ391	390	
R416	ERJ3GEYJ123	12K	
R417	ERJ3GEYJ474	470K	
R418	ERJ3GEYJ104	100K	
R419	ERJ3GEYJ223	22K	
R420	ERJ3GEYJ473	47K	
R421	ERJ3GEY0R00	0	
R422	ERJ3GEYJ333	33K	
R425	ERJ3GEY0R00	0	
R427	ERJ3GEY0R00	0	
R431	ERJ3GEYJ563	56K	
R432	ERJ3GEYJ561	560	
R433	ERJ3GEY0R00	0	
R901	ERJ3GEYJ221	220	
R902	ERJ3GEYJ103	10K	
R903	ERJ3GEYJ155	1.5M	
R904	ERJ3GEYJ154	150K	
R906	ERJ3GEYJ155	1.5M	
D302	PQ4R10XJ000	0	S
L302	PQ4R10XJ000	0	S
L303	PQ4R10XJ000	0	S
L304	PQ4R10XJ000	0	S
L401	PQ4R10XJ000	0	S
J302	PQ4R10XJ000	0	S
J901	ERJ3GEY0R00	0	
J902	ERJ3GEY0R00	0	
J903	ERJ3GEY0R00	0	
J904	ERJ3GEY0R00	0	
J905	PQ4R10XJ000	0	S
J906	PQ4R10XJ000	0	S
J907	PQ4R10XJ000	0	S
J908	PQ4R10XJ000	0	S
J909	PQ4R18XJ000	0	S
		(CAPACITORS)	
C2	PQCUV1H154KR	0.15	
C3	PQCUV1H154KR	0.15	

Ref. No.	Part No.	Part Name & Description	Remarks
C4	PQCUV1A684KB	0.68	
C101	ECKD2H681KB	680P	S
C102	ECKD2H681KB	680P	S
C103	ECUV1H103KBV	0.01	S
C104	ECUV1H472KBV	0.0047	
C106	ECEA1CKA100	10	
C108	ECUV1H103KBV	0.01	
C109	ECUV1E223KBV	0.022	
C110	ECEA1CKA100	10	
C151	ECUV1C104KBV	0.1	
C152	ECUV1H332KBV	0.0033	
C160	ECUV1H183KBV	0.018	
C181	ECUV1H681JCV	680P	S
C182	ECUV1H681JCV	680P	S
C183	ECUV1H121JCV	120P	
C185	ECUV1C104ZFV	0.1	
C301	ECEA1HU220	22	S
C302	ECEA1AU101	100	
C303	ECUV1C104ZFV	0.1	
C304	ECEA0JKS220	22	S
C305	ECUV1C104ZFV	0.1	S
C306	ECEA0JU102	1000	S
C307	ECEA1AU101	100	S
C308	ECUV1C104ZFV	0.1	S
C311	ECEA0JU331	330	
C312	ECUV1H103KBV	0.01	S
C313	ECEA1CKA100	10	
C314	ECUV1H103KBV	0.01	S
C320	ECUV1H180JCV	18P	
C321	ECUV1H150JCV	15P	
C323	ECEA1CKA100	10	
C324	ECUV1C104ZFV	0.1	
C325	ECUV1C104ZFV	0.1	
C326	ECUV1C104ZFV	0.1	
C327	ECUV1C104ZFV	0.1	
C328	ECUV1C104ZFV	0.1	
C329	ECUV1C104ZFV	0.1	
C330	ECUV1C104ZFV	0.1	
C331	ECUV1C104ZFV	0.1	
C332	ECUV1H101JCV	100P	
C333	ECUV1H101JCV	100P	
C334	ECUV1H101JCV	100P	
C335	ECUV1H101JCV	100P	
C336	ECUV1H101JCV	100P	
C337	ECUV1H101JCV	100P	
C338	ECUV1H101JCV	100P	
C339	ECUV1H101JCV	100P	
C340	ECUV1H101JCV	100P	
C341	ECUV1H101JCV	100P	
C342	ECUV1H101JCV	100P	
C343	ECUV1H101JCV	100P	
C344	ECUV1H101JCV	100P	
C345	ECUV1C104ZFV	0.1	
C346	ECUV1C104ZFV	0.1	

Ref. No.	Part No.	Part Name & Description	Remarks
C350	ECUV1H681JCV	680P	S
C401	ECEA0JU220	22	
C402	ECUV1C563KBV	0.056	
C403	ECUV1H103KBV	0.01	
C404	ECUV1H103KBV	0.01	
C411	ECUV1C104KBV	0.1	
C412	ECUV1H103KBV	0.01	
C413	ECUV1C104KBV	0.1	
C414	ECUV1H183KBV	0.018	
C415	ECUV1C104KBV	0.1	
C418	ECUV1H101JCV	100P	
C420	ECUV1H392KBV	0.0039	
C421	ECUV1C104KBV	0.1	
C426	ECEA1CKS220	22	S
C901	ECEA1CKA100	10	
C902	ECUV1H472KBV	0.0047	
C903	ECUV1H103KBV	0.01	
C904	ECUV1H103KBV	0.01	
C906	ECUV1H103KBV	0.01	

17.1.3. OPERATION P.C. BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB2	PQWP2TMC40BX	OPERATION P.C. BOARD ASS'Y (RTL)	
		(LEDS)	
LED801	PSVD1SRCT	LED	S
LED802	PSVD1SRCT	LED	S
LED803	PSVD1SRCT	LED	S
		(JACKS)	
CN801	PQJS24X54Z	CONNECTOR	S
		(OTHERS)	
E1	PQJM122Z	BUILTIN, MICROPHONE	
E2	PQMG10025Z	RUBBER PARTS, MIC	
E3	PQJE10091Z	FLEXIBLE FLAT CABLE	

17.1.4. ACCESSORIES AND PACKING MATERIALS

Ref. No.	Part No.	Part Name & Description	Remarks
A1	PQJA10075Z	CORD, TEL LINE	
A2	PQJA212M	CORD, HANDSET	
A3	PQJXC0102Z	HANDLE/HANDSET	
A4	PQKL10035Z2	STAND, WALL MOUNTING ADAPTOR	ABS-HB
A5	PQLV1BXZ	AC ADAPTOR	⚠
A6	PQQX13388Z	INSTRUCTION BOOK	
A7	PQQW12669Z	QUICK REFERENCE GUIDE (for Arabic)	
A8	PQQW12744Z	LEAFLET	
P1	PQPH89Y	PROTECTION COVER	
P2	PQPK13759Z	GIFT BOX	
P3	PQPD10553Z	CUSHION	

18. FOR SCHEMATIC DIAGRAM

18.1. SCHEMATIC DIAGRAM(MAIN)

Notes:

1. DC voltage measurements are taken with voltmeter from the negative voltage line.

Important Safety Notice:
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only the manufacturer's specified parts.

This schematic diagram may be modified at any time with the development of new technology.

19. SCHEMATIC DIAGRAM(MAIN)

20. CIRCUIT BOARD (MAIN)

20.1. Component View

20.2. Flow Solder Side View

21. SCHEMATIC DIAGRAM(OPERATION)

22. CIRCUIT BOARD (OPERATION)

22.1. Component View

22.2. Flow Solder Side View
H / KXTMC40JXW /
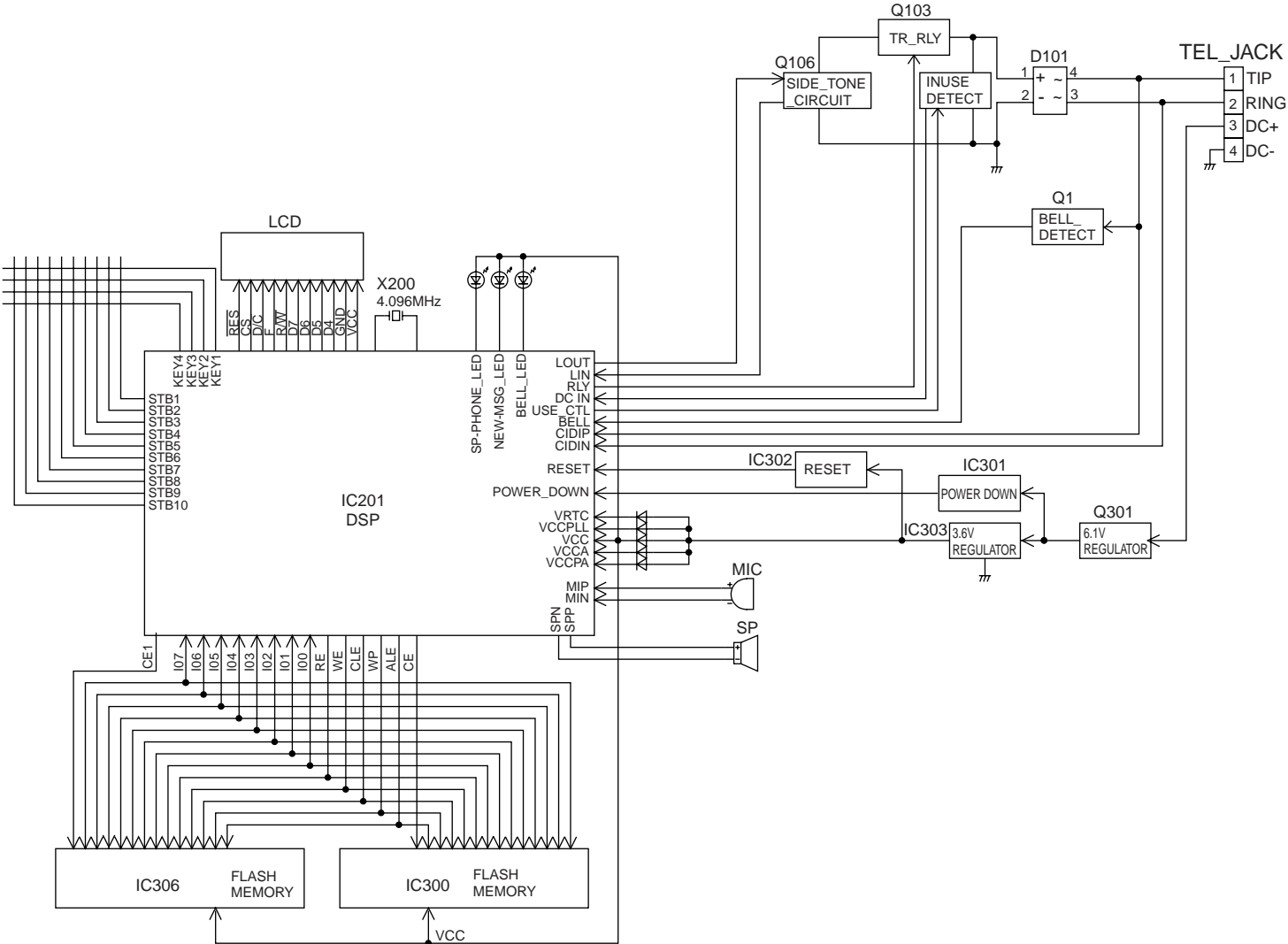
KX-TMC40JXW : BLOCK DIAGRAM

KX-TMC40JXW : SCHEMATIC DIAGRAM (MAIN)

KX-TMC40JXW : SCHEMATIC DIAGRAM (MAIN)
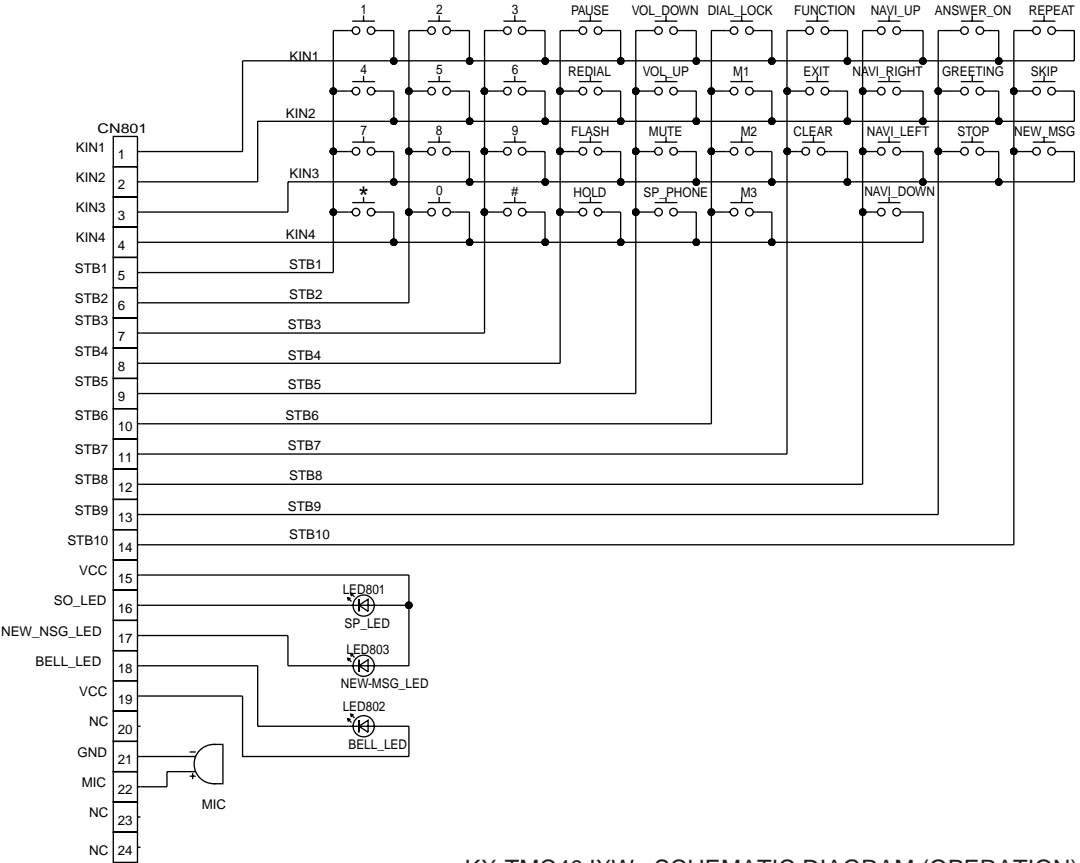
PQUP11141ZB

KX-TMC40JXW : MAIN BOARD : COMPONENT VIEW
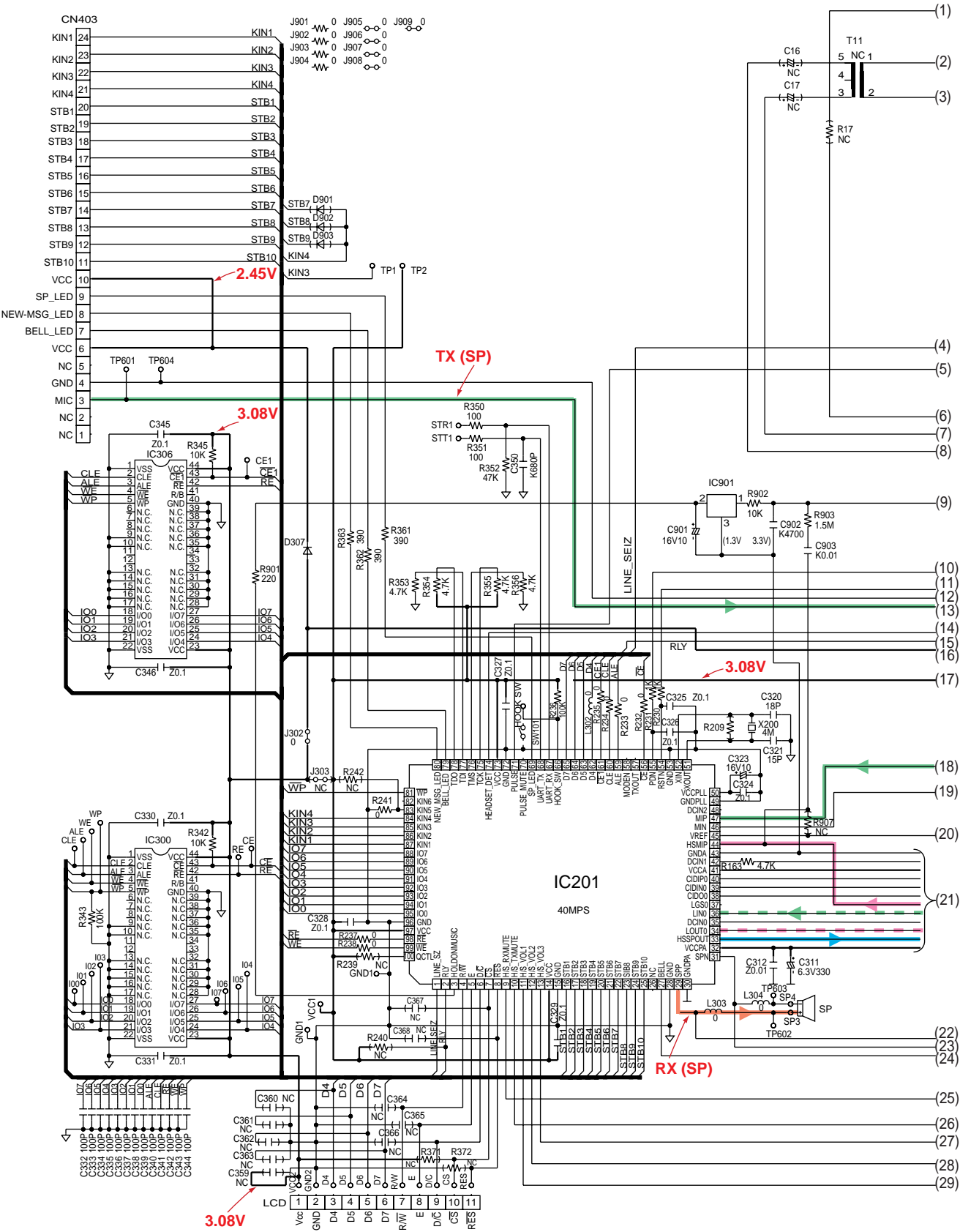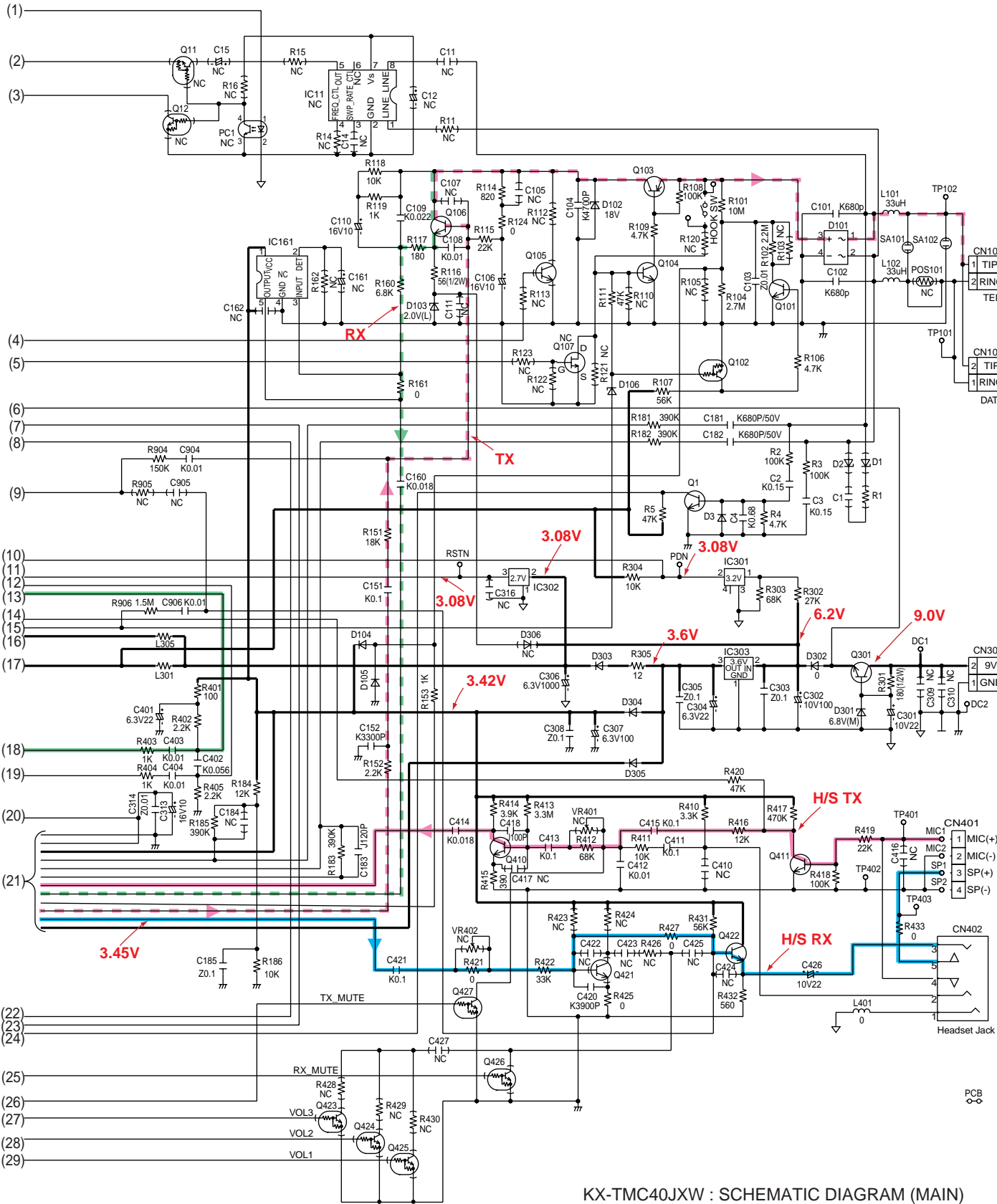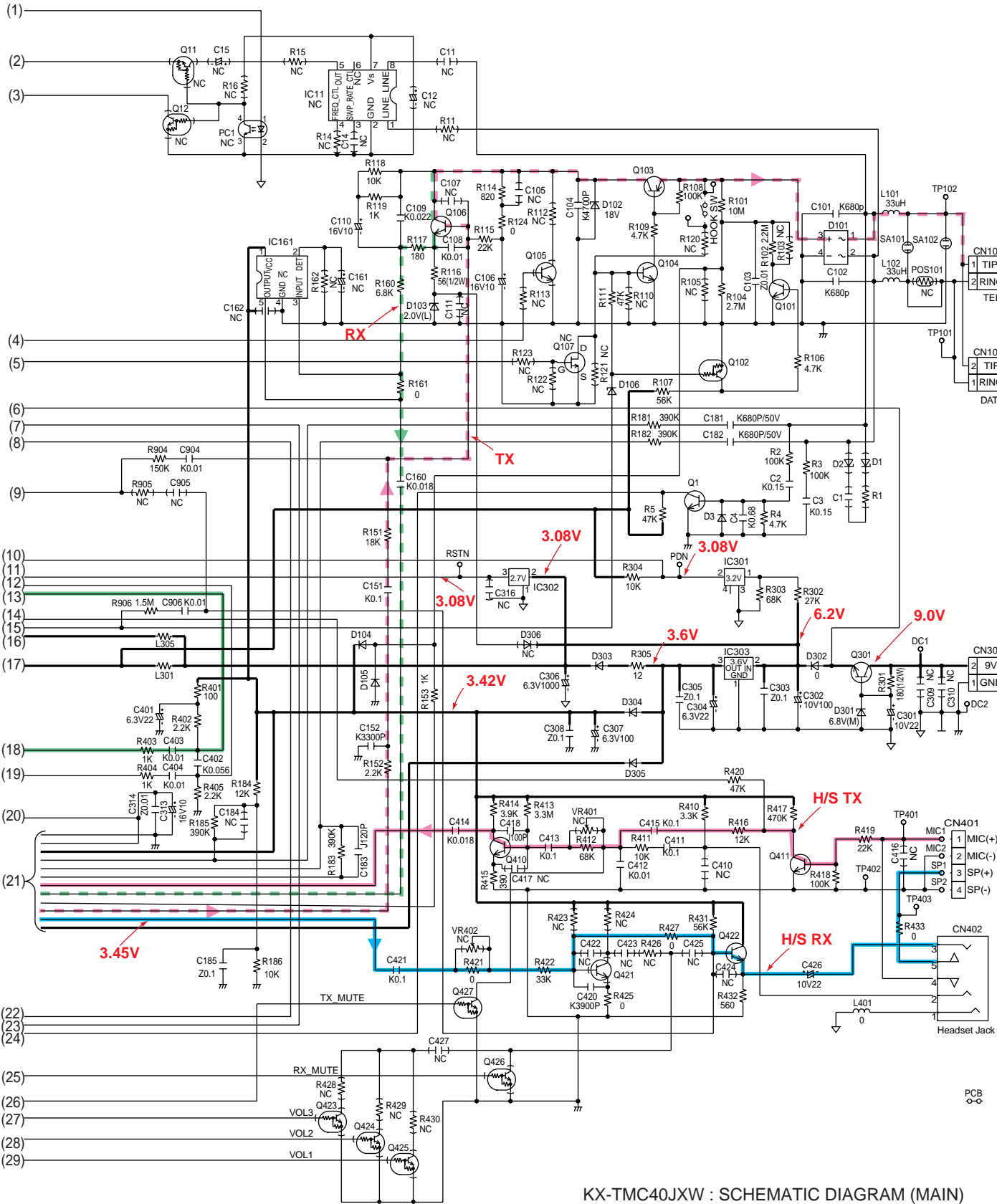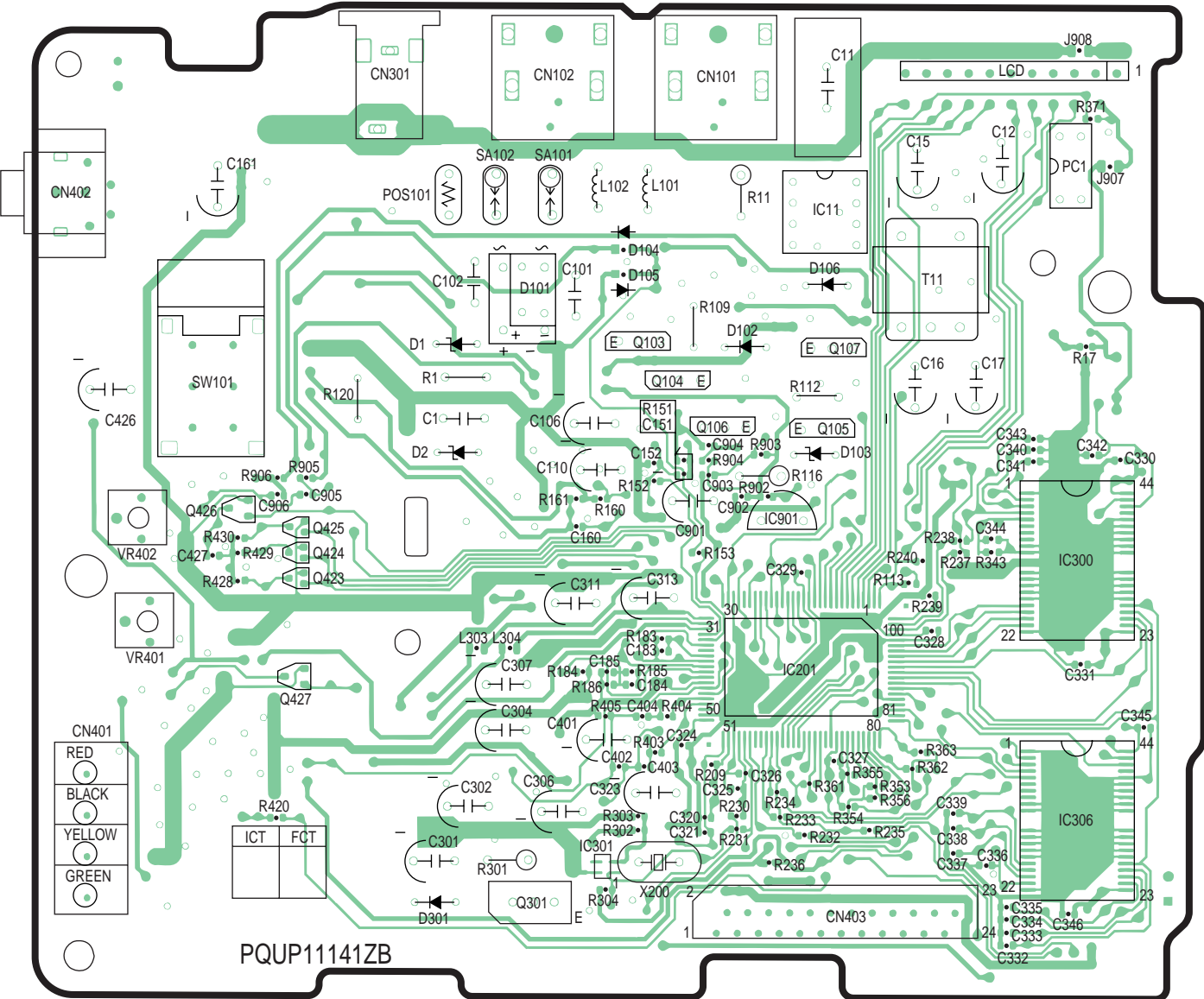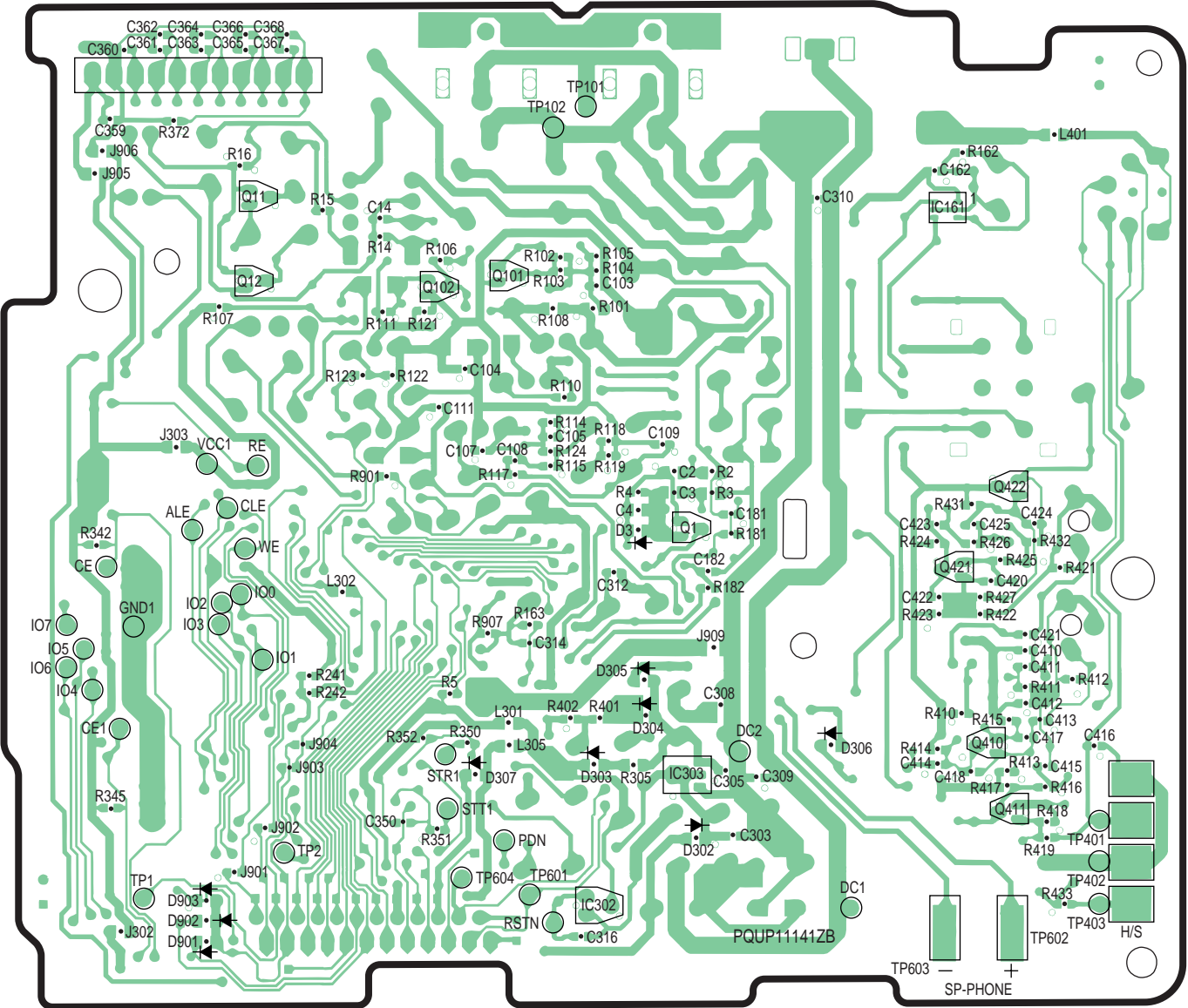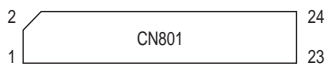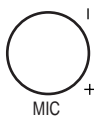
KX-TMC40JXW : MAIN BOARD : BOTTOM VIEW

KX-TMC40JXW : SCHEMATIC DIAGRAM (OPERATION)

2   CN801   24
1   23

PQUP11143ZA

MIC

KX-TMC40JXW : OPERATION BOARD : COMPONENT VIEW
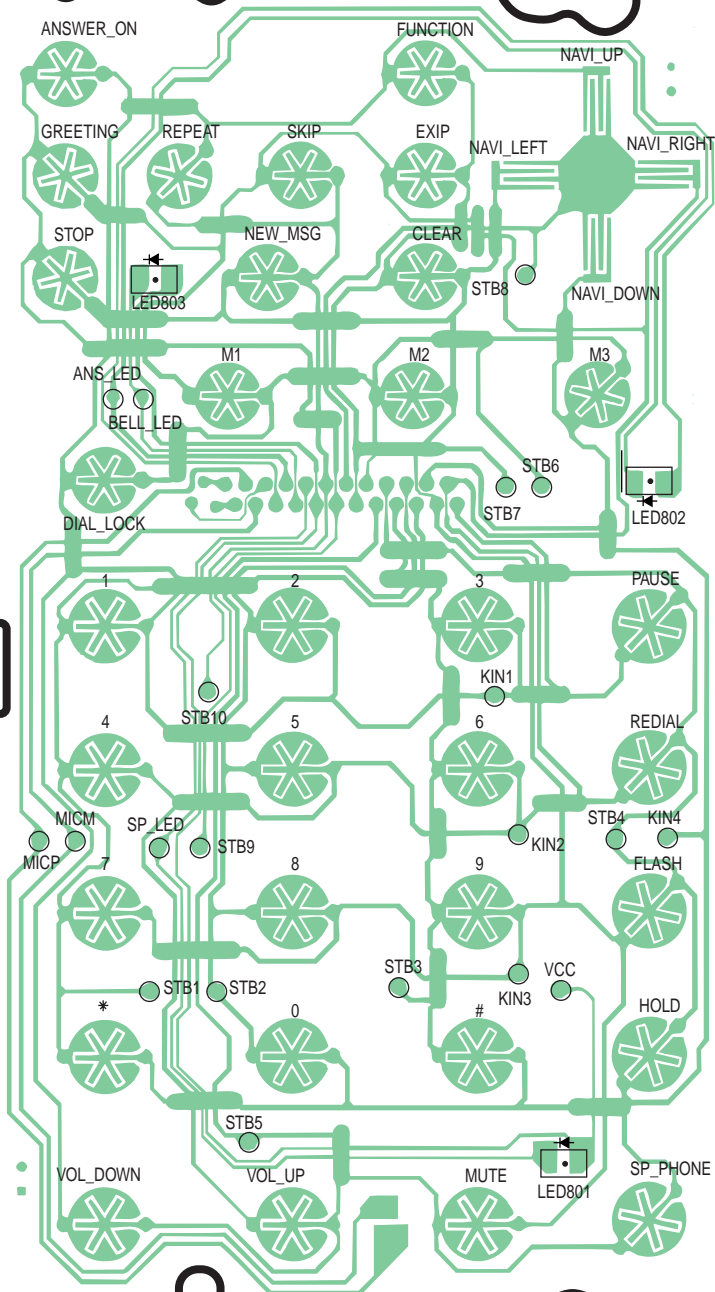
KX-TMC40JXW : OPERATION BOARD : BOTTOM VIEW